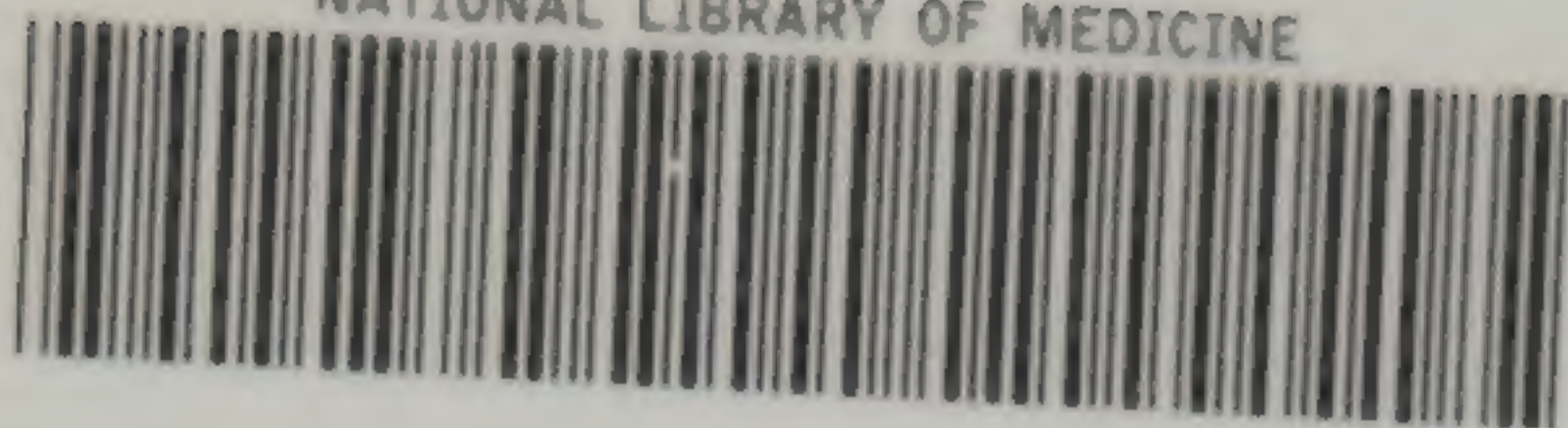


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CLASS-BOOK

OF

OPERATIVE GYNECOLOGY.

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BY

J. F. BALDWIN, A. M.; M. D.,  
III

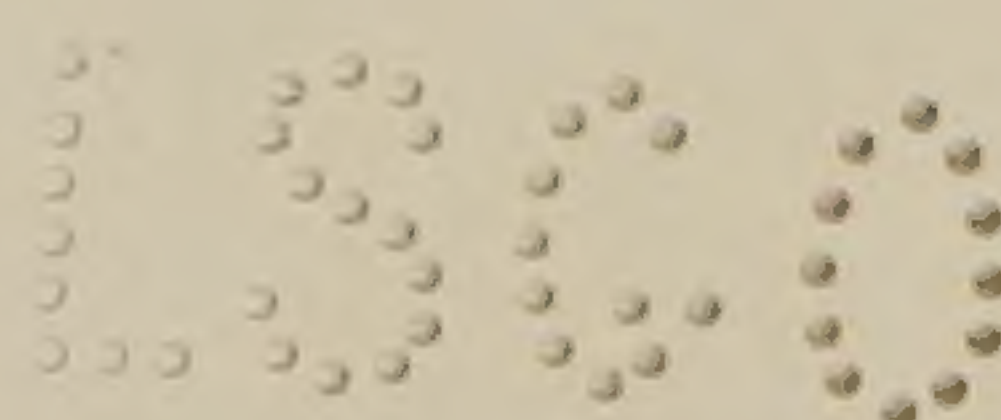
Professor of Operative Gynecology, Ohio Medical University ; Gynecologist to Protestant Hospital ; Fellow of the American Association of Obstetricians and Gynecologists ; Member of the American Medical Association, Etc., Etc.

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ILLUSTRATED BY 147 CUTS.

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# PREFACE.

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THE adoption by the Ohio Medical University of the recitation plan of instruction, in all its departments, necessitated the selection of text-books suited to this method of teaching. In many of the departments such books were easily obtained, but nothing could be found in the way of Operative Gynecology at all suited to class-room needs. The necessity, however, of having something of the sort became more and more apparent with each succeeding year, so that at last I decided to issue a work of my own, of such character as I had found needed for the method of teaching adopted by the University.

The resulting Class-book is limited in its scope almost exclusively to Surgical Gynecology. No space is given, as a rule, to non-operative gynecology or to the anatomy of the parts involved, their histology, pathology, or physiology, since these subjects are fully considered by my colleagues.

Nearly all the text-books on gynecology are confusing to the student, since in order to secure the completeness which their authors desire they contain more or less full descriptions, usually, of a multiplicity of methods of performing the different operations. It has, therefore, seemed to me best to give, as a rule, but a single method of performing each operation. It is easy to impress this particular method upon the student's mind, both in the recitation room and in the clinical amphitheatre. As he goes into practice and commences to perform these operations for himself, if he should ever be called upon to do so, he will come to take a broader view of the subject and will then change his methods as necessities and his own expertness may require or suggest.

Terry  
17 AUG 1908



The methods of operating herein described are those which, after a rather wide observation and no inconsiderable experience, the author has found the best. Other surgeons will doubtless in some instances find points for criticism in the technique recommended, but the author stands ready, under proper circumstances, to defend his own views, or to change them if convinced that he is in any way in error. The operation recommended for lacerated perineum will probably be criticised by many operators. Its adoption, however, was finally determined only after careful observation of the work of some of the strongest advocates of what is known as the Emmet operation, and after careful study of the anatomy of the parts involved. Its advantages have been demonstrated to many medical students and practitioners, and it has successfully withstood the test of time and, in many cases, of repeated parturition.

Surgeons who are interested in the field of labor herein considered will find scattered through the book a number of "wrinkles" which, while in themselves of no very great importance, will perhaps be found convenient in practice and of some value in results.

Many of the illustrations are original, and while not from an artistic point of view deserving of favorable notice, will doubtless serve to make clearer the context. The cuts illustrating the Chapter on Vaginal Hysterectomy are taken, with some modifications, from Dr. Dunn's article in the *American Journal of Obstetrics*, for October, 1896, and from Landau's recent work. I am under obligations to Messrs. Truax, Greene & Co., of Chicago; Tiemann & Co., of New York, and Willms, and F. Arnold & Sons, of Baltimore, for the cuts of surgical instruments.

J. F. B.



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# CLASS BOOK

OF

## OPERATIVE GYNECOLOGY.

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### CHAPTER I.

#### ASEPSIS AND ANTISEPSIS.

**I**F the gospel of cleanliness is of importance in the work of the general surgeon, it is doubly so in that of the gynecological specialist. In the work of the general surgeon infection usually means merely increase of pain and delay in healing; it is seldom that there is any special risk to life itself or to the preservation of function. With the gynecologist, however, in much of his work infection means the speedy death of the unfortunate patient.

I. THE OPERATOR. The personal cleanliness of the operator is of great importance, and a general bath before operating is desirable. His outer clothing should be removed and a special operating suit donned instead. The operating suit should be made of thin white goods and should be taken immediately from the sterilizer. Under ordinary circumstances it would be pleasanter for the operator to remove even most of his underclothing, as he will feel much fresher after operating if he makes a complete change. The hands and arms should be made as absolutely clean as possible by prolonged scrubbing with soap and hot water and a sterile brush. The character of the soap is not of special importance, but soft soap, or the tincture of green soap, is to be preferred. Running water from the tap is better than the use of a bowl, but is not usually accessible outside of hospitals. The finger nails should be kept trimmed short, and should be cleaned before each operation by a smooth-pointed file, or a splinter of



wood, such as a willow twig or a wooden tooth-pick. Hang nails should be carefully removed. This mechanical cleansing of the hands and arms should occupy not less than ten or fifteen minutes, and the time should be determined by the clock or sand glass and not guessed at.

If the operator's hands have been engaged in distinctly septic work, something more than, and in addition to, mechanical cleanliness should be secured. Under such circumstances the hands and arms after the above washing should be immersed in a solution of permanganate of potassium, 5 parts to 1,000, until the skin is uniformly brown: the color should then be removed by washing in a saturated solution of oxalic acid, and the excess of acid washed off with sterilized water. The hands may then be immersed for a minute or two in a 1-1,000 solution of bi-chloride of mercury, the solution being rinsed off with sterile water.

Under ordinary circumstances, however, sterilization is equally well secured by the use of chloride of lime and carbonate of sodium (common washing soda). After the mechanical cleansing of the hands, as above described, about a teaspoonful of chloride of lime is taken into the hands, together with a crystal of carbonate of soda, as large as a large almond, and the whole well moistened with water. This makes a species of paste, which is then rubbed thoroughly into the skin, especially around the nails, for two or three minutes. There is a free evolution of chlorine gas resulting in a sensation of warmth to the skin. The application should be continued until a cooling sensation is manifest, when the whole should be washed off with sterile water. The skin is very apt to become unpleasantly roughened by the frequent use of the permanganate of potassium and oxalic acid, and also of the bi-chloride solution. The chloride of lime combination is much milder, while the results, from a bacteriological point of view, seem to be equally satisfactory.

DISAGREEABLE ODORS may be prevented from clinging to the hands by immersing the hands previously in turpentine. This will be found especially valuable in cases of cancer of the womb.



A properly folded sheet makes a very good substitute for the more convenient operating apron. Fold the sheet once lengthwise. Turn down about a foot, more or less according to the length of the sheet and the height of the operator, of one end of the folded sheet over a piece of ordinary bandage, about a yard long. Tie this bandage around the neck so that the short piece of the sheet is next the operator, then fasten the sheet around the waist with another strip of bandage, from which can be suspended a towel for the operator's hands.

2. THE PATIENT. Sterilization of the field of operation, freely including surrounding parts, should be commenced as soon as the patient enters the hospital: usually two or three days before the time set for operation. A general bath should be given, in which soap and scrubbing brush should play an important part. The abdomen and mons veneris, or mons veneris and vulva, as the case may be, should be carefully shaved. If an abdominal section is contemplated, the abdomen should be covered with a compress moistened in a 1-2,000 bi-chloride solution. In addition, it should be scrubbed with soap and water on at least three occasions, if time permit, before the operation. The same treatment should be accorded the region of the vulva if a vaginal operation is to be made. As even in abdominal operations it is possible that the vagina may require opening, this should be as thoroughly sterilized as possible. This is done by douches; first, of sterilized water, then of bi-chloride solution, 1-1,000, and then of sterilized water to remove the mercurial, lest poisoning or irritation follow its use. Just before the operation the vagina should be thoroughly scrubbed out with soap and water. The fingers of the operator, or of a nurse or assistant, will do this much better than a cotton swab or even a brush, as every recess of the vagina can be easily and safely penetrated by the fingers. Following the soap and hot water, the vagina should be flushed out with 1-1,000 bi-chloride, and this followed by sterile water.

3. INSTRUMENTS. These are best sterilized by boiling for five minutes in a one per cent. solution of carbonate of soda. The



presence of the alkali prevents rusting. This presupposes that the instruments were thoroughly cleaned with brush and sapolio, with plenty of hot water, after the preceding operation. Following an operation on a septic subject, the instruments, in addition to being mechanically cleaned as above described, should be boiled for at least half an hour in a five per cent. carbolic acid solution.

DRAINAGE TUBES of glass or rubber can be boiled with the instruments.

4. LIGATURES AND SUTURES. Silk, silk-worm gut, and wire can be sterilized by boiling with the instruments. Unless the silk is quite fine, it should, however, be boiled for fifteen minutes. The silk should be loosely wound on glass spools, so that the heat can reach all parts. As the silk is weakened by repeated boilings, only such a quantity should be boiled as will not greatly exceed what the operator thinks will likely be used.

CATGUT, as representing the class of animal ligatures, may be sterilized in a variety of ways. One of the best is probably Martin's, which is as follows: Cut the gut into lengths of about forty inches and twist each into a loose knot. Soak in ether for twenty-four hours, to remove the fat. Boil in alcohol in a steam sterilizer, in a closed jar, for one hour. With sterile hands and sterile forceps remove from the jar of alcohol to a jar containing a solution of pyoctanin, 1-1,000, in absolute alcohol. After remaining in this for twenty-four hours it is distributed into sterilized one-half ounce bottles containing sterilized oil of juniper. Four lengths should be placed in each bottle, which is then corked with a sterilized rubber stopper. These bottles are kept immersed in a receptacle containing a 1-1,000 bi-chloride solution, from which solution each bottle is taken as needed for the operation. Any catgut left unused is destroyed, so that it is necessary to open a fresh bottle for each occasion.

A simpler method, and one which has given excellent clinical results at St. Anthony's Hospital, is as follows: The commercial catgut is rather loosely wound on glass spools and immersed for



twenty-four hours in sterile water. It is next placed in a five per cent. solution of formalin for thirty-six hours. It is then preserved in pure alcohol, from which a single spool is removed as required for use. The unused portion is re-immersed in the formalin solution for a few minutes and then replaced in the alcohol.

As the absolute sterility of the animal ligature is essential, it is important that in case there is any doubt as to its character the material shall be subjected to bacteriological examination. If this examination shows freedom from infection, the material may be used with impunity.

5. DRESSINGS. These can usually be sterilized best by boiling and drying, or if already clean they can be freshly sterilized by sprinkling with water and ironing with a hot iron. Where a steam sterilizer is at hand, of course the dressings are sterilized by being kept in it for an hour or more.

SPONGES have been so generally displaced by gauze pads that their sterilization will not be considered.

IODOFORM GAUZE is prepared with so much trouble that it is probably best to obtain it in all cases from a reliable manufacturer. It should be obtained in small packages, so as to obviate exposure of a package to infection by repeatedly opening the container. Iodoform gauze will be frequently referred to. It should be distinctly understood that iodoform is in no sense an antiseptic. Both it and the gauze with which it is incorporated require thorough sterilization and the gauze must be carefully sealed in tight containers. The action of iodoform is merely upon leucomaines and ptomaines, which, as they form, are destroyed by a process of reduction. Hence it is that iodoform gauze possesses certain advantages over simply sterile gauze.

6. FURNITURE. The operating room should contain as little furniture as possible. Pictures and window hangings should all be removed. All furniture remaining and all wood work should be scrubbed clean, the floor especially, and moistened by bi-chloride solution. The side-walls and ceilings should be



wiped off with a dampened cloth, so as to get rid of all dust. If the water with which the cloths are moistened is a bi-chloride solution the antiseptic will do no harm, while the person whose task it is to use it will probably be more thorough in its application than if it were plain water. If the operation is made in a private residence of doubtful or unknown antecedents, the operating room should be sterilized by the use of sulphur fumes or formalin vapor.

DIRECTIONS FOR NURSE. It is well for the surgeon in preparing for any operation to refer to a previously prepared list of instruments, dressings, etc., so that he may be sure that everything at all likely to be needed will be at hand. He should see that the nurse is provided with a bed-pan, catheter, thermometer, temperature chart, hypodermic syringe and bent glass feeding tube. There should also be on hand one pint of alcohol, a few ten grain powders of sulfonal, brandy and tablets for sublimate solution. The nurse should be given specific written or printed instructions about as follows:

1. Take up the carpet, remove curtains, draperies and all furniture except two or three small tables and one or two chairs; clean the room; clean the walls and ceiling with a brush or broom covered with a towel; wash the floor, woodwork and furniture with carbolic solution, 1 : 40.

2. Secure a firm four-legged table in front of a window giving the best light.

3. Remove the window-curtains, and screen the lower sash by a strip of gauze.

4. Four small tables for instruments, dressings, etc.

5. Two blankets on the bed inside of sheets.

6. Protect the bed by a rubber cloth and a draw sheet.

7. Ten hot-water bottles well corked.

8. Waste water bucket.

9. Four china wash bowls and one tin basin (for patient in case of vomiting).



10. Four sheets and fifteen towels, wrung out of sublimate solution, 1 : 1000, the night before the operation and rough-dried.

11. Large safety pins.

12. Nail brush.

13. Two pitchers of cooled boiled water.

14. Boiler of hot boiled water.

15. A many tailed binder.



## CHAPTER II.

### ANESTHESIA.

**L**OCAL ANESTHESIA may be used in a few gynecological operations. For producing it a mixture of finely broken ice and salt may be applied, by means of a thin cloth container, to the part to be anesthetized. The application is by no means painless, and the operator must be ready to operate as soon as the skin becomes white. If too long applied a blister will form, or even a slough may be produced.

More manageable than this mixture is the ethyl chloride spray. This liquid comes in small bottles with a screw cap, and the warmth of the hand suffices to project a fine spray upon the field of operation. As with the ice, the operation should commence as soon as the skin becomes white.

The most generally used of all anesthetics, however, is a solution of cocaine. The solution should be freshly prepared and the water carefully sterilized, otherwise its use may interfere with the primary healing of the wound. A two to five per cent. solution is generally used. With care to use as small an amount as possible, there will seldom be observed any untoward symptoms. In cases of heart disease, or other conditions forbidding general anesthesia, operations as extensive as amputation of the thigh, removal of the breast, and even an abdominal section have been successfully made.

In operations which would require the use of a considerable amount of cocaine the constitutional effects of the drug are to be feared, and it is then safer to use the anesthetic fluid devised by Schleich: cocaine muriate, two parts; morphine muriate, one-fourth part; sodium chloride, two parts; sterilized water, one thousand parts. This fluid may be freely injected into the skin along the line of proposed incision, and into the connective tissue as extensively as may be desired.



GENERAL ANESTHESIA. In the United States ether, chloroform, and the A. C. E. mixture are the agents chiefly used for the production of general anesthesia, and they are probably used in the order named.

Ether is doubtless safer in the hands of an unskilled anesthetizer. It is also probably safer in cases of heart disease.

Chloroform should be given the preference in cases in which there is any diseased condition of the kidneys or the lungs. While the mortality from chloroform is apparently four or five times greater than that from ether, it should be remembered that when chloroform kills it does so promptly and during the very act of administration. Its mortality is, therefore, easily a matter of record. With ether, however, while the immediate mortality is small, most careful observers are agreed that many deaths occurring within a few days after its administration should really be placed to its account, although usually charged to some pulmonary or renal complication.

The A. C. E. mixture (alcohol one part, chloroform two parts, ether three parts), has never come into anything like general use, either in this country or abroad. Its chief advocate in this country is Dr. J. C. Reeve, of Dayton, O. His views are entitled to great weight, but the probability is that its actual mortality is much larger than that indicated by available statistics. It is in bad repute in Columbus, at least, as not less than four deaths from its administration have occurred in this city during the last two years. None of these cases have been reported.

NUSBAUM'S NARCOSIS is secured by the hypodermic administration of one-fourth grain of morphia before commencing the administration of either chloroform or ether. The writer has had an extensive experience with this use of morphia, in both chloroform and ether anesthesia, and highly recommends it. The patient takes the anesthetic easier, a much smaller quantity is required to maintain unconsciousness, and the after effects of the anesthetic are much less unpleasant. The morphia must not be used if it is known that the patient possesses any idiosyncrasy against it.



Whatever general anesthetic is selected, the anesthetizer should be regarded as one of the most important assistants in connection with the operation, and his entire attention should be devoted absolutely to its administration.



FIGURE 1—Allis Ether Inhaler.

For the administration of ether the Allis inhaler (Fig. 1), or one of its modifications, is most frequently used. For chloroform the Esmarch inhaler (Fig. 2) and drop bottle are the most satis-

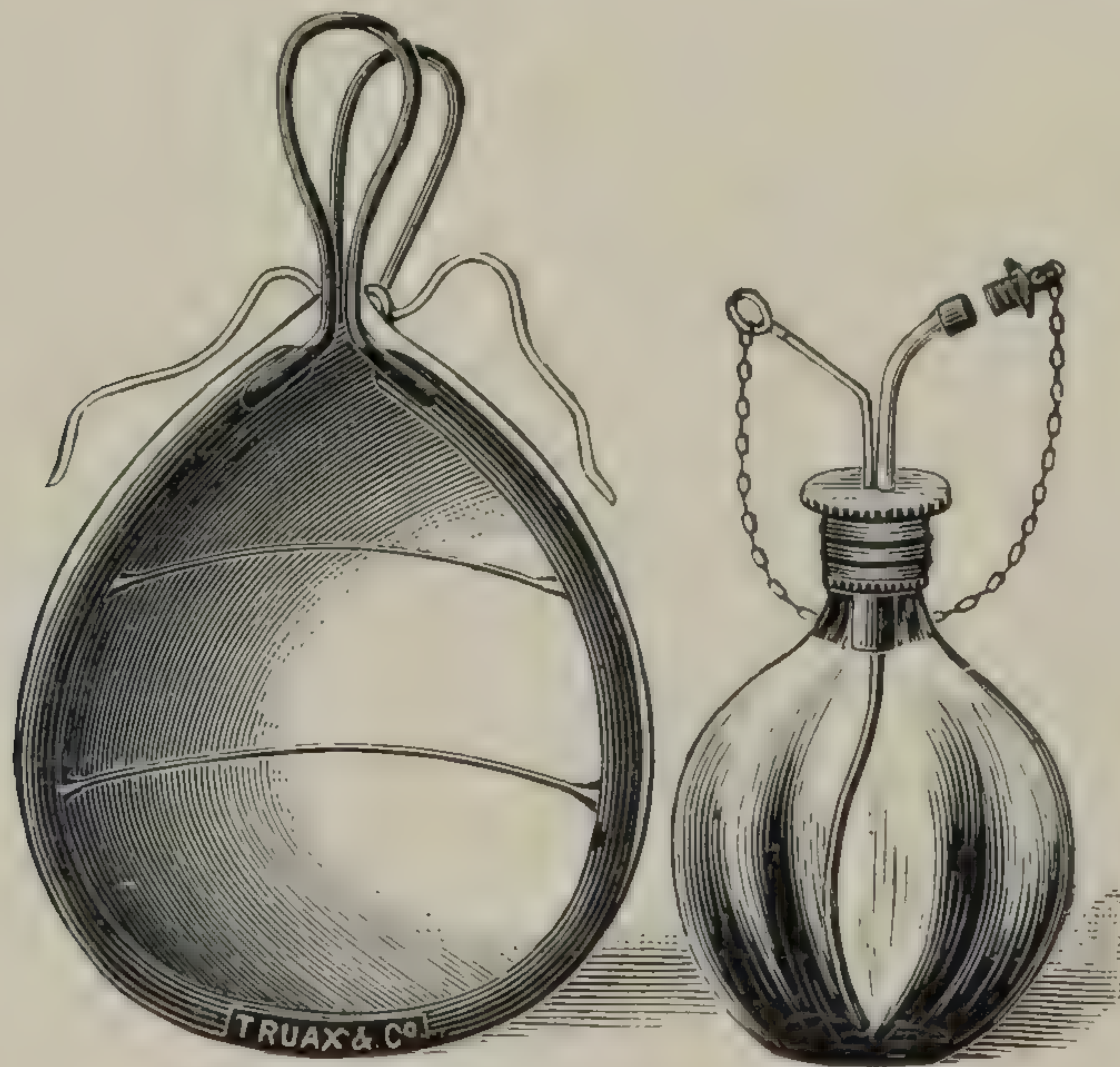


FIG. 2—Esmarch's Chloroform Inhaler.

factory and safe. Care should be taken to see that all false teeth are removed, the clothing about the neck and waist loosened, and the exposed portions of the face protected by the application of oil, lard, or vaseline. The inhaler should be held a few inches



from the face at the beginning of the process, in order that the patient may become "anesthetized to the anesthetic." By thus allowing the patient to have plenty of fresh air we obviate the alarm which is apt to be expressed when the anesthetic is crowded. When this alarm is entirely unreasoning, as in the case of children, the anesthetic should be pushed as rapidly as possible, as thus the period of distress is much lessened.

In case the tongue drops back and interferes with respiration it can usually be held forward by pressing the lower jaw upward by the fingers applied just back of the angle. If this does not suffice, the tongue must be seized with a tongue forceps and drawn forward. The sharp forceps, which gives merely a punctured wound, should be preferred to any form of instrument which compresses, as the latter is liable to produce sloughing.



## CHAPTER III.

### NEEDLES AND SUTURING.

**N**EEDLES are either straight or curved. The curved needle may be half or full curved, and curved throughout its entire extent or only toward its point. So far as the point is concerned, this may be simply sharp and round, or bayonet shaped. The Hagedorn needle (Fig. 3) is a modification of



FIG. 3--Hagedorn Needle.

the latter, the cutting edge in this needle being at the outer side. For certain purposes needles with handles, the eye near the point of the needle (Fig. 4), possess certain marked advantages. The

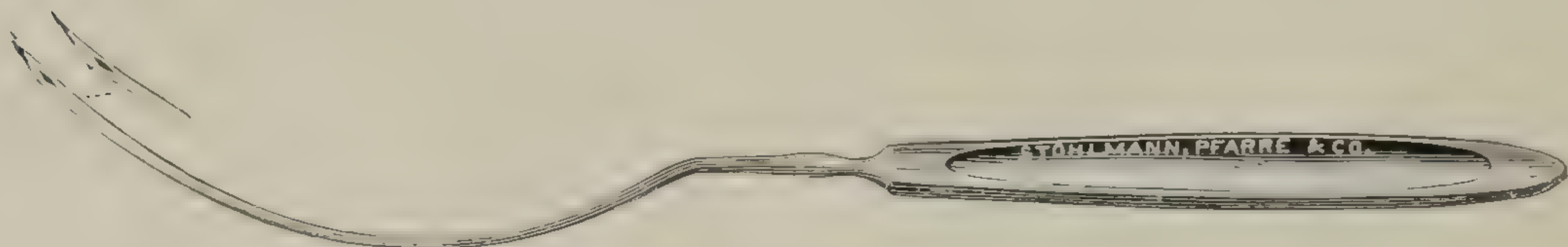


FIG. 4--Needle with eye in the point, for closing abdominal incision. (Half size.)

handle may be continuous with the shaft of the needle, or it may be placed at any desired angle.

NEEDLE HOLDERS are on the market in an almost infinite variety. The needle holder, however, which after much experience I have come to prefer, is one constructed like the ordinary hemostatic forceps, except with longer handles and with jaws designed to firmly grasp either the ordinary or the Hagedorn needle. Most needle forceps are too complicated and require too much manipulation, especially in loosening their grasp.

It is well to remember, however, that fingers were made long before needle holders, and for many purposes the use of the



fingers instead of the instrument will add to the comfort of the operator and save much time. It is frequently very trying to see an operator ignoring his fingers and expending much time and energy in attempting to manipulate his needle with some new-fangled needle holder.

For closing the abdominal incision and for certain operations on the perineum, a handled needle will be found to save much time and to give the operator much better control of the parts. In the introduction of silk-worm gut in closing incisions, I am in the habit of using a fairly strong needle with an eye near the point (Fig. 4), or preferably a French needle with a well guarded hook on its under side just back of the point. The silk-

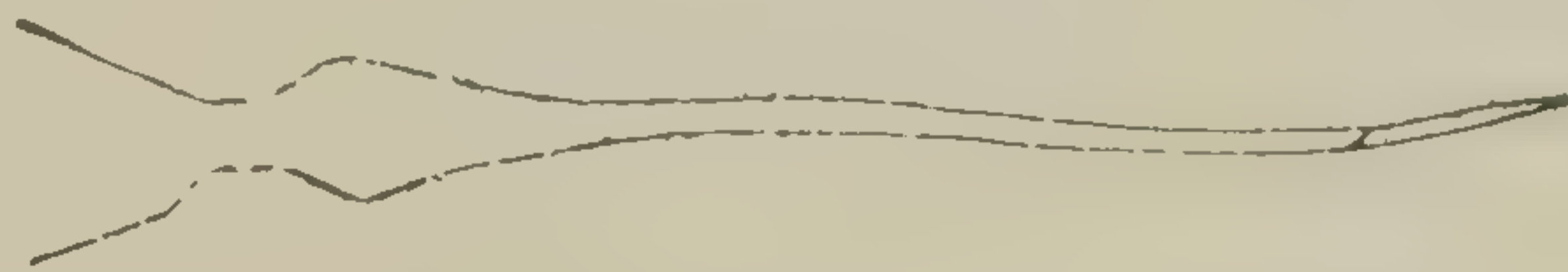


FIG. 5—French needle with spur on the under side. The groove guarding the spur is not shown in the cut. (Half size.)

worm gut is easily caught and engaged in this hook, and the handle is quickly withdrawn. The hook thus possesses certain manifest advantages over the eye. Whenever the needle with the eye is used, it is better to introduce the needle first and thread it before its withdrawal.

While the round needle, having no cutting edge, gives rise to no hemorrhage following its introduction, it is difficult to pass it through the skin, and hence its use is limited to inside work and to mucous membranes.

An ordinary bayonet-pointed needle possesses two cutting edges, and as the cut which it makes in its insertion is parallel with the incision which is to be closed, when the suture is tied the two small wounds are drawn upon and gape open. The Hagedorn needle produces a similar wound, but this is at right angles to the main incision, and on tying the suture there is no gaping of the wounds of its introduction (Fig. 6).



For intestinal work a fine round sewing needle will answer best, as it presents no cutting edge.

**SUTURE MATERIALS.** For most purposes silk or catgut meets every indication. In some cases, especially in vesico-vaginal fistula work, where, in addition to a suture, something like a firm support is needed, nothing has been found to take the place of silver wire, first introduced by Sims. The reputation of the silver wire was gained in the pre-antiseptic days, and the results secured by it are to be attributed more to unintentional asepsis

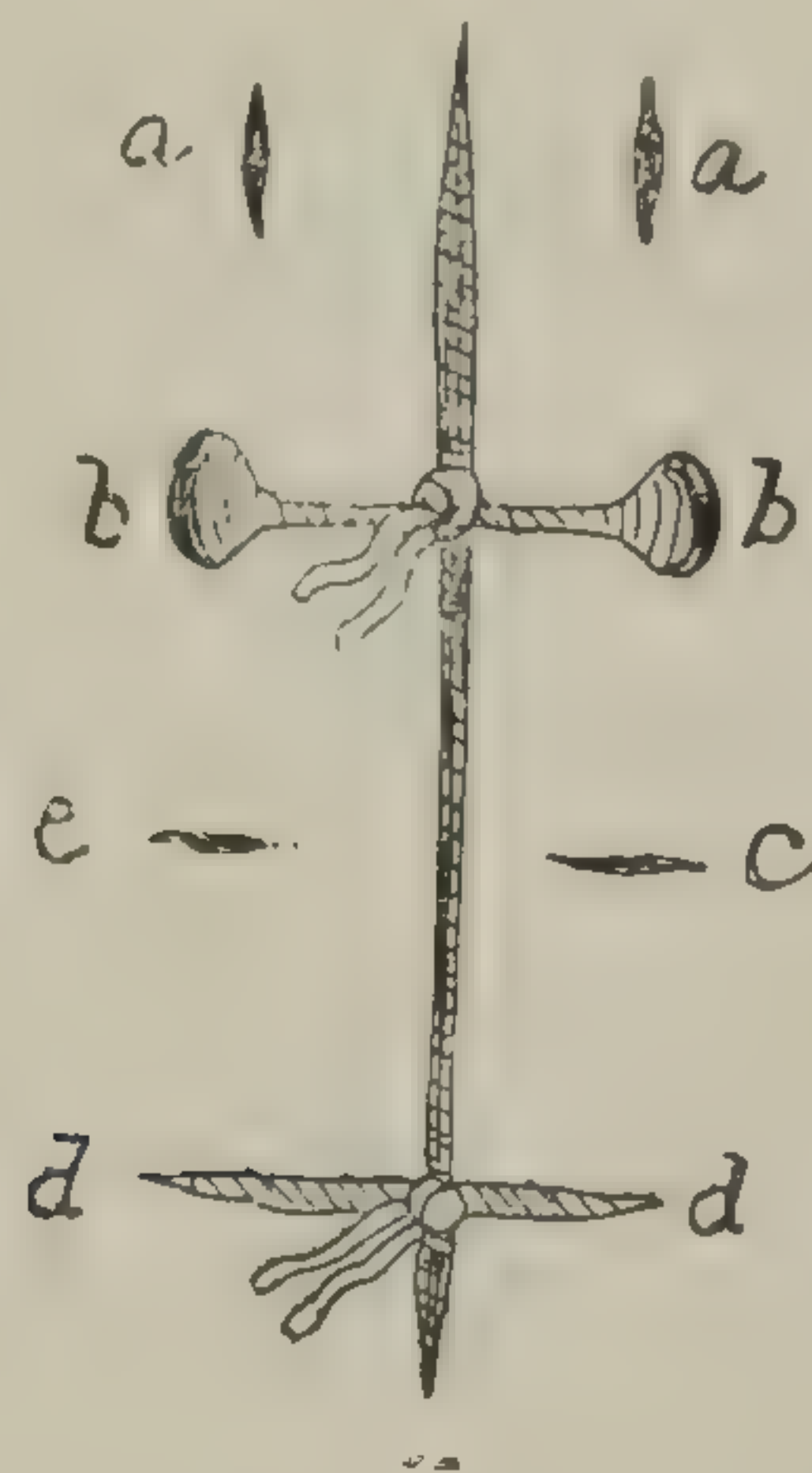


FIG. 6—Diagram showing wound produced by different forms of needle and the effect on same of tying the suture.

- |                                     |                        |
|-------------------------------------|------------------------|
| <i>a.</i> Wound of ordinary needle. | <i>c.</i> Suture tied. |
| <i>b.</i> Wound of Hagedorn needle. | <i>d.</i> Suture tied. |

than to the character of the material used. At the present time, however, even for fistula work, catgut and silk are used much more than silver wire.

Kangaroo tendon, being stronger and being absorbed more slowly than catgut, is used instead of the latter in places in which these qualities render its use more desirable.

Iron wire has been occasionally used, and where cheapness is an object nothing better than the iron can be found.

Silk-worm gut has been used by some as a buried suture, but it is as unabsorbable as wire, and is in every respect inferior to it. If it once becomes infected the resulting sinus will never close until the stitch is removed. I once had occasion to remove a



number of silk-worm gut sutures from the pelvic cavity where they had been placed by another operator four years previously. The material was as bright and hard as when first placed, and showed not the slightest evidence of having been affected by its long residence in the tissues.

If silk is selected it should be pure, but whether it is braided or twisted is immaterial. Silk used as a buried suture should be as fine as possible, as it will thus be less apt to be infected and will be more promptly absorbed. It should never be used where there is any likelihood of infection, as in cases of pus tubes or pelvic abscesses. It answers admirably in intestinal work, as it very promptly finds its way into the bowel.

Catgut does not make as firm a knot as silk, and when used it should be tied in three knots, to avoid slipping.

VARIETIES OF SUTURES. Practically but three varieties of suture are used: First, the ordinary interrupted suture. Second, simple continued sutures. Third, stay sutures.

1. INTERRUPTED SUTURE. This is the suture that is most frequently used in closing ordinary incisions. Its principal advantage is, that each suture can be drawn to the necessary degree of tightness and tied without fear of its becoming loosened. The knot which is used should be the ordinary reef knot, or the true surgeon's knot, in contra-distinction to the technical surgeon's knot, which is very little used.

2. THE CONTINUED SUTURE. This can be most advantageously used where there is no special tension on the parts to be united, or in cases of deep wounds where it is desired to use a suture in layers to approximate the deep surfaces. Catgut is the material which is almost invariably used in deep wounds, and in superficial work, such as closing the incision following an amputation of the breast. This material may be used with advantage, as the operation is thus completed much more speedily than if interrupted sutures are used.

Many times it is well to combine the continued and the interrupted sutures. The judgment of the surgeon must indicate under what circumstances this should be done.



3. STAY SUTURES. In closing deep wounds, especially where there is considerable resistance, it is sometimes wise to introduce stay sutures (Fig. 7) to relieve the tension upon those which are used to secure apposition. Silver wire or silk-worm gut should be used for this purpose. They should be introduced an inch or more back from the edge of the incision, and as deeply as necessary. Each suture may be reintroduced about one quarter of an inch from its point of original exit and carried back parallel with the original course. A wisp of iodoform gauze can be introduced in the loop thus formed at one side and the suture tied on the opposite side over a similar roll of gauze. If silver wire is used it should be made to transfix a pad of iodoform gauze, and then held in sufficient tension by a perforated shot

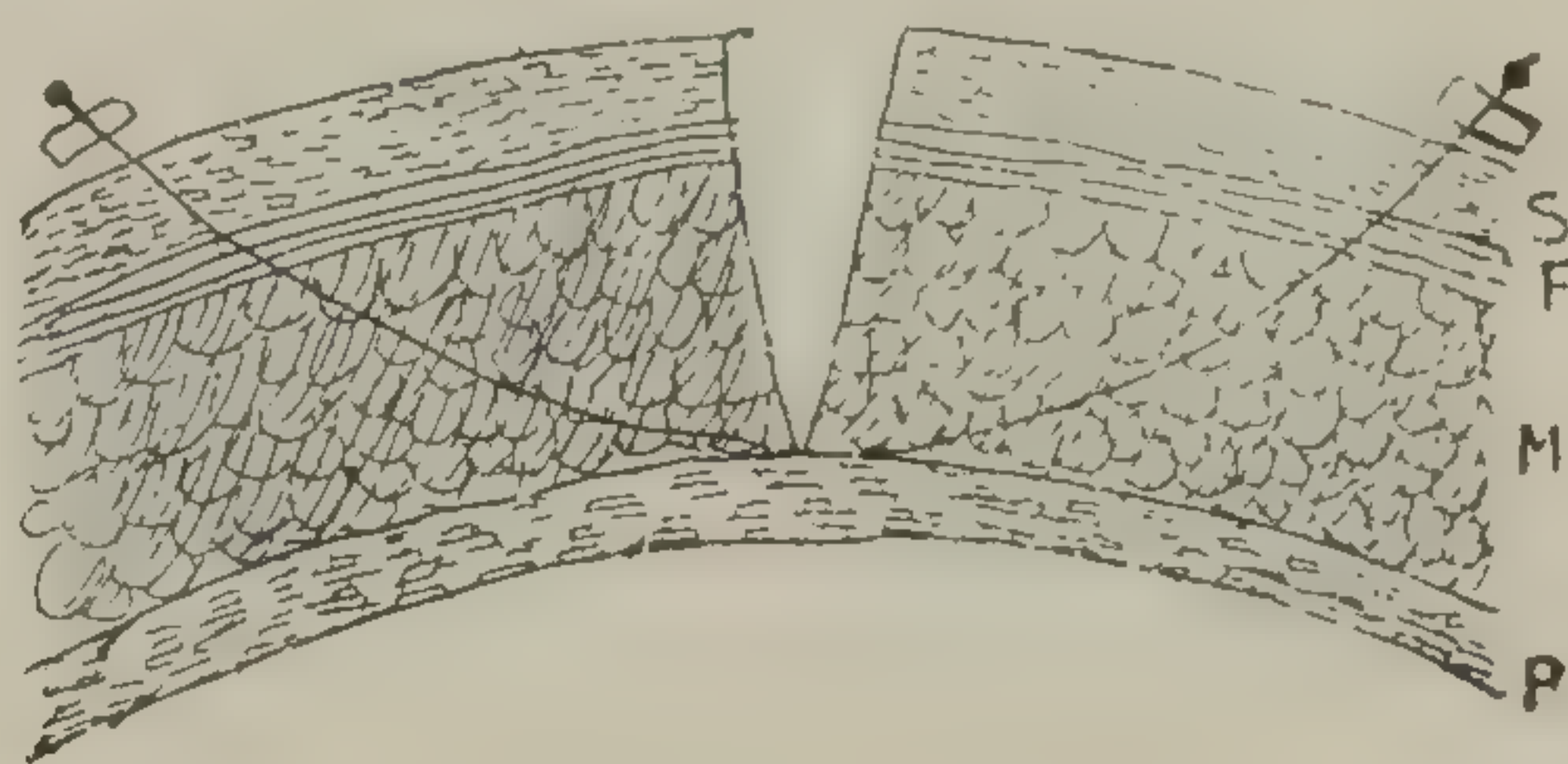


FIG. 7—Stay suture to secure approximation of the deep parts. The gauze pledgets and perforated shot are shown in position, but the suture not drawn down.

clamped outside of the gauze. These stay sutures are of especial advantage in closing the abdominal incision in subjects having thick walls. They may be left in for a week or two weeks, as the case may require. In removing them the iodoform gauze should be lifted a little from the skin and the surface underneath cleansed by a one to five hundred bi-chloride solution. The wire is then cut as close to the surface as possible and the remaining portion withdrawn from the other end. By thus cleansing the skin there is no danger of introducing infection along the track of the withdrawing stitch.

The stay suture is also exceedingly valuable (Goldspohn) in closing the abdominal incision in cases of ventral hernia with wide separation of the recti muscles. In these cases, which are usually the result of a previous operation, the cicatricial tissue should be thoroughly removed and the recti muscles broadly



exposed. The stay sutures should then be introduced between the belly of each muscle and the peritoneum and brought through the skin at the outer margin of the muscle. The peritoneum should then be closed with continuous catgut, the stay sutures drawn tight enough to thoroughly approximate the recti muscles, and the fascia and over-lying structures closed in the usual way. The stay sutures thus used not only support the muscular tissues in thorough apposition, but relieve the strain upon the less favorably placed sutures.

**THE SUBCUTICULAR SUTURE.** This suture (Fig. 8) is used more particularly in cases in which it is desirable to make the scar

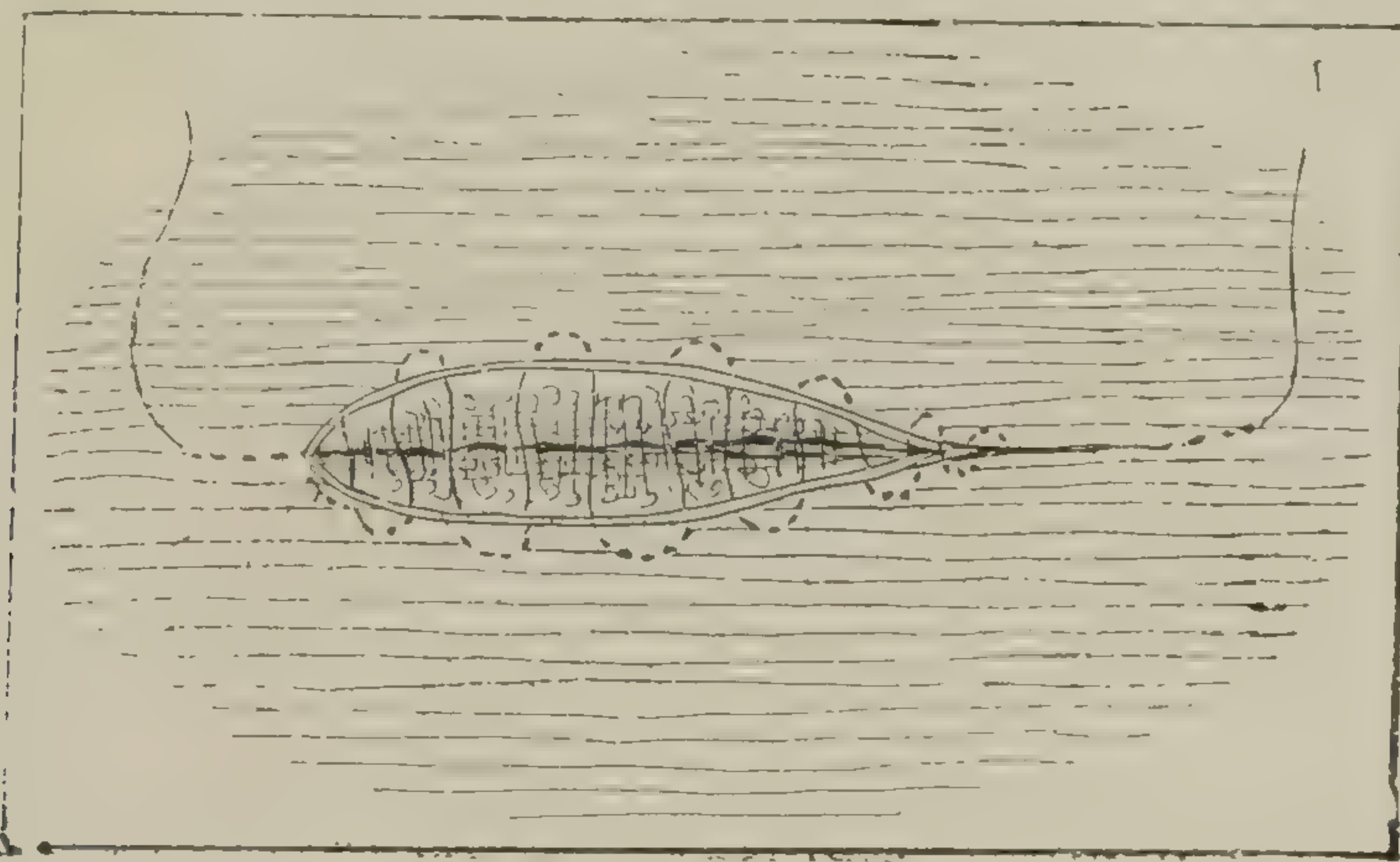


FIG. 8—Subcuticular suture for closing the skin incision. Suture in place but not tightened.

as small as possible. Catgut or fine kangaroo tendon is used for this purpose. The stitch is introduced at right angles to the line of incision and in the tissues lying immediately below the skin. A needle of short curve should be used in its introduction. Care is necessary to introduce each stitch so that the point of entrance is exactly opposite the point of exit of the preceding stitch. After introducing the stitches through the entire length of the incision, each end of the suture is brought out through the skin. By drawing on the opposite ends, very accurate apposition of the sides of the incision may be secured. Collodion should then be applied, so as to hold the parts in the position thus obtained. The collodion covering should be made to include the two points of exit of the suture. As the collodion dressing is removed after the lapse of ten days, the catgut ends come away with it.



## CHAPTER IV.

### HEMOSTASIS.

**P**RESSURE may be exercised either by pressure forceps (Fig. 11), as upon a blood vessel, or, where the surface is large, by sponges or gauze pads. It is frequently surprising to witness the effect of firm pressure continued for a minute or two on a large surface from which the blood had been previously oozing at an almost alarming rate. The experienced operator will frequently pack into the bed, from which he has just enucleated a tumor, several gauze sponges and unconcernedly proceed with work in some other part of the abdomen or pelvis, feeling well assured that when he comes to remove the sponges he will find a practically dry surface. If the oozing does not yield to the mere pressure of the sponge, the sponge should be dipped, by means of a forceps, in boiling water and the hot water thus applied to the part. A few operators have carried out the suggestion that steam could be applied to the bleeding surface with equally good results, but the appliances for this use of steam are seldom at hand, while the hot water is always available. Where a surface is to be covered in, as in abdominal and pelvic work, no harm will result from this application of heat. The same would not be true if the surface were to be afterwards exposed to the air, as more or less necrosis would likely ensue.

PRESSURE FORCEPS are used to the exclusion of almost every other means of hemostasis in checking the hemorrhage occurring along the line of primary incision. Even in removing a cancerous breast and cleaning out the axilla, ligatures will seldom be needed, and they only of the finest catgut. The forceps will seldom need to be left on longer than two or three minutes. In their application care should be exercised not to inclose any of the skin, as this is likely to become devitalized, with resulting suppuration. In case a small artery spurts and it is not con-



venient to leave the forceps attached, the artery can be seized and twisted two or three times around, when it will be found that the forceps can be removed with safety.

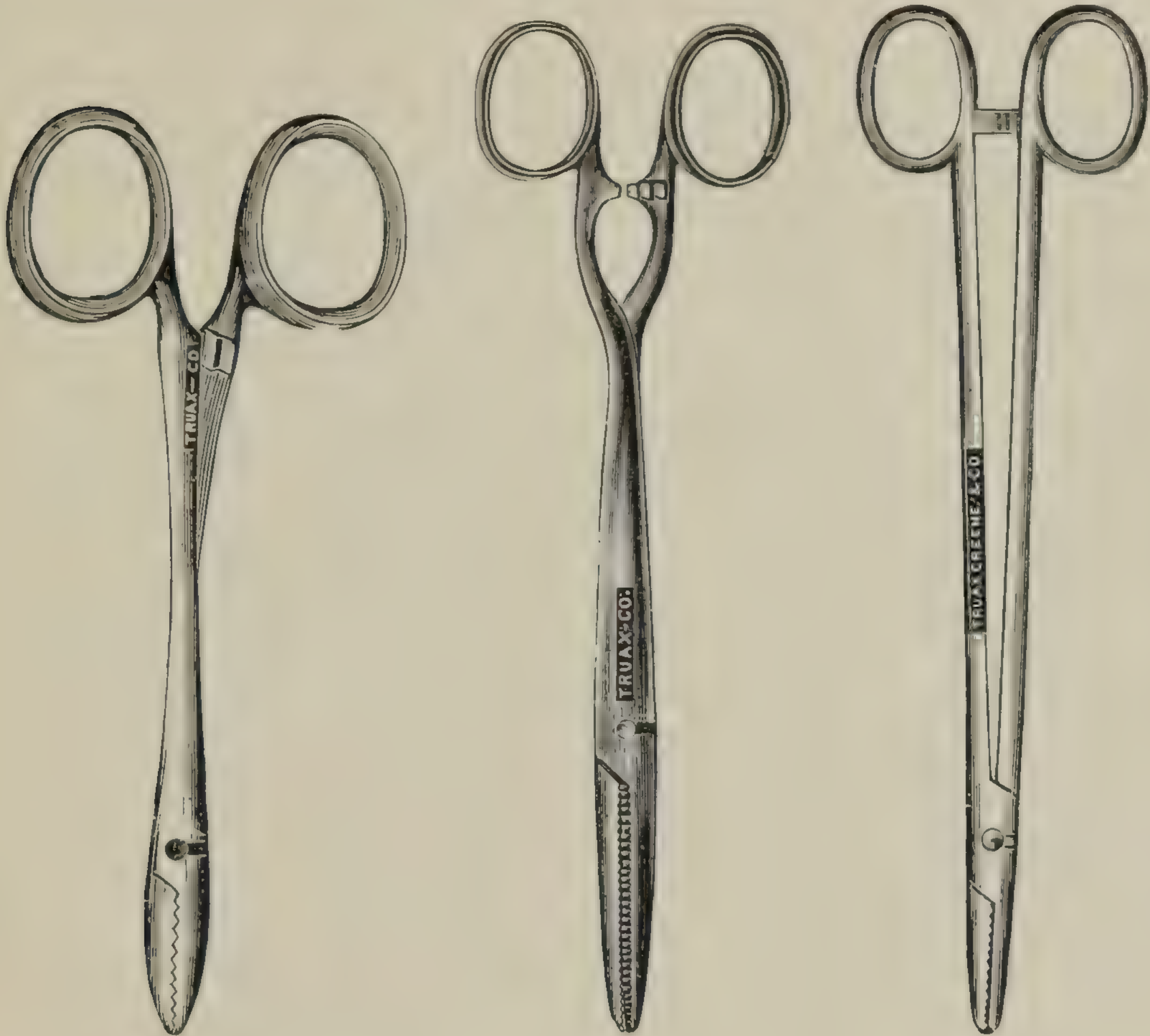


FIG. 9.

FIG. 10.

FIG. 11.

Various forms of pressure forceps.

**LIGATURES.** The material of ligatures has already been considered. Their application is a matter of no little importance. The ordinary surgeon's ligature, tied with a reef knot (Fig. 16,*b*), if of silk, or with a third knot if of catgut or kangaroo tendon, is that which is most frequently used in gynecological work. Where it is possible to avoid it, it is undesirable to ligate any considerable amount of tissue—ligation *en masse*—but it is much better surgery to isolate and ligate each bleeding vessel. In some cases, however, this separation is not possible, or is possible only at the sacrifice of too much time. Under such circumstances,



and where the mass is too large to be safely trusted to a single ligature, the Staffordshire knot (Fig. 12), (brought into special prominence by Mr. Tait,) or Bantock's modification (Fig. 13) of

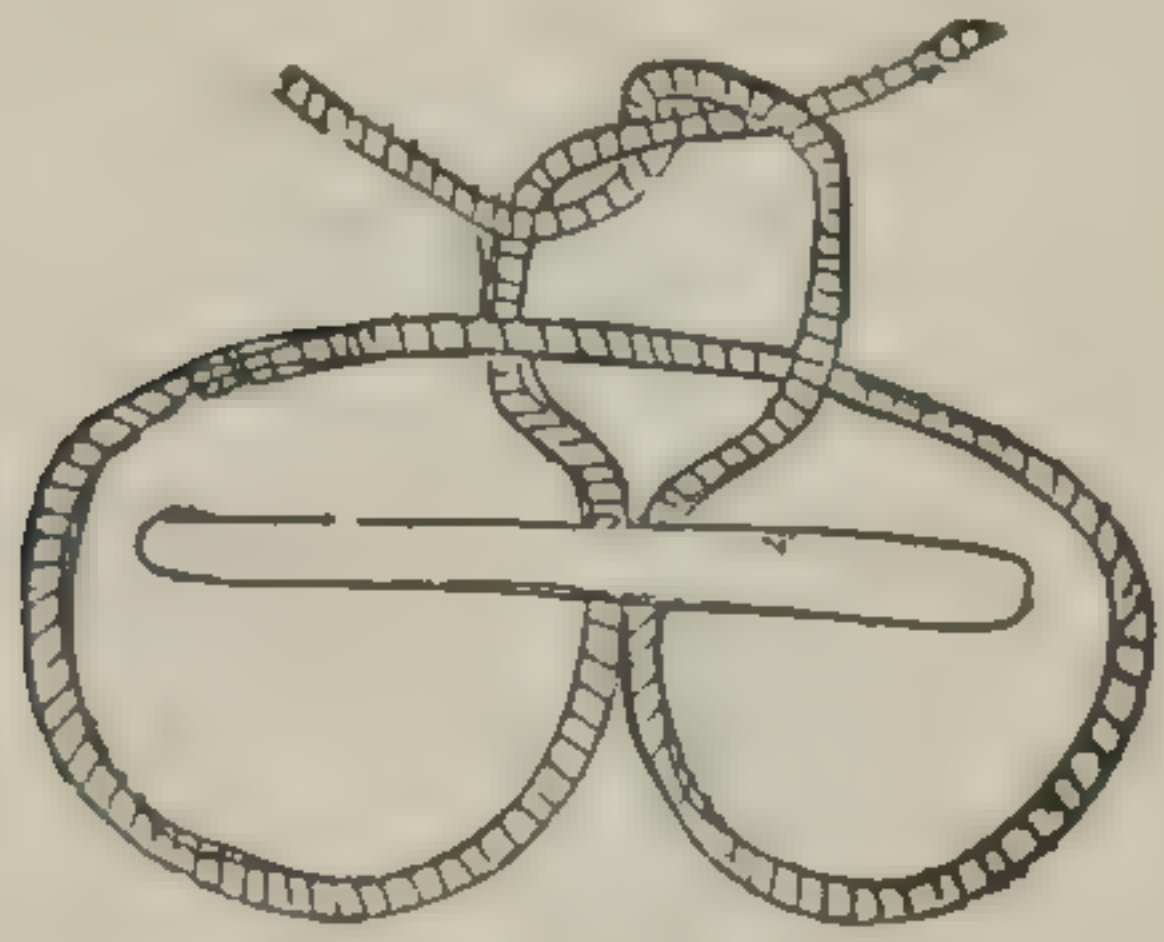


FIG. 12—Staffordshire knot.

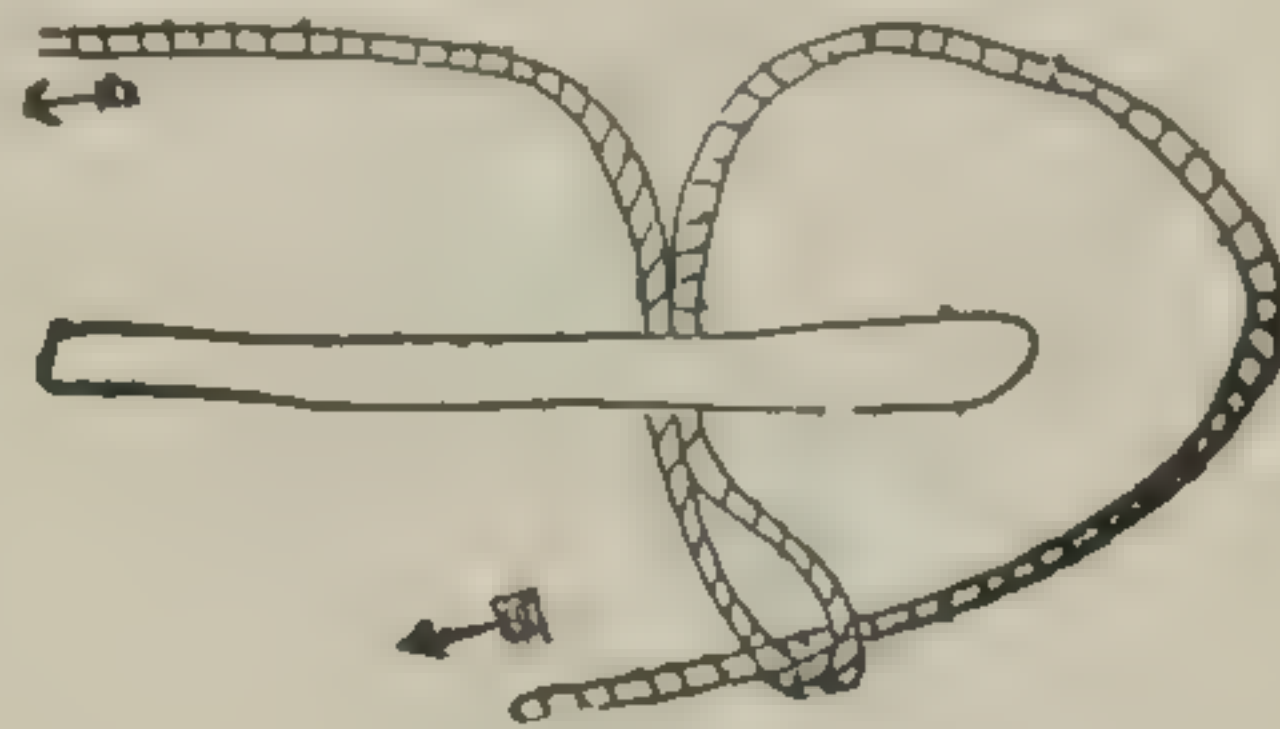


FIG. 13—Bantock's modification.

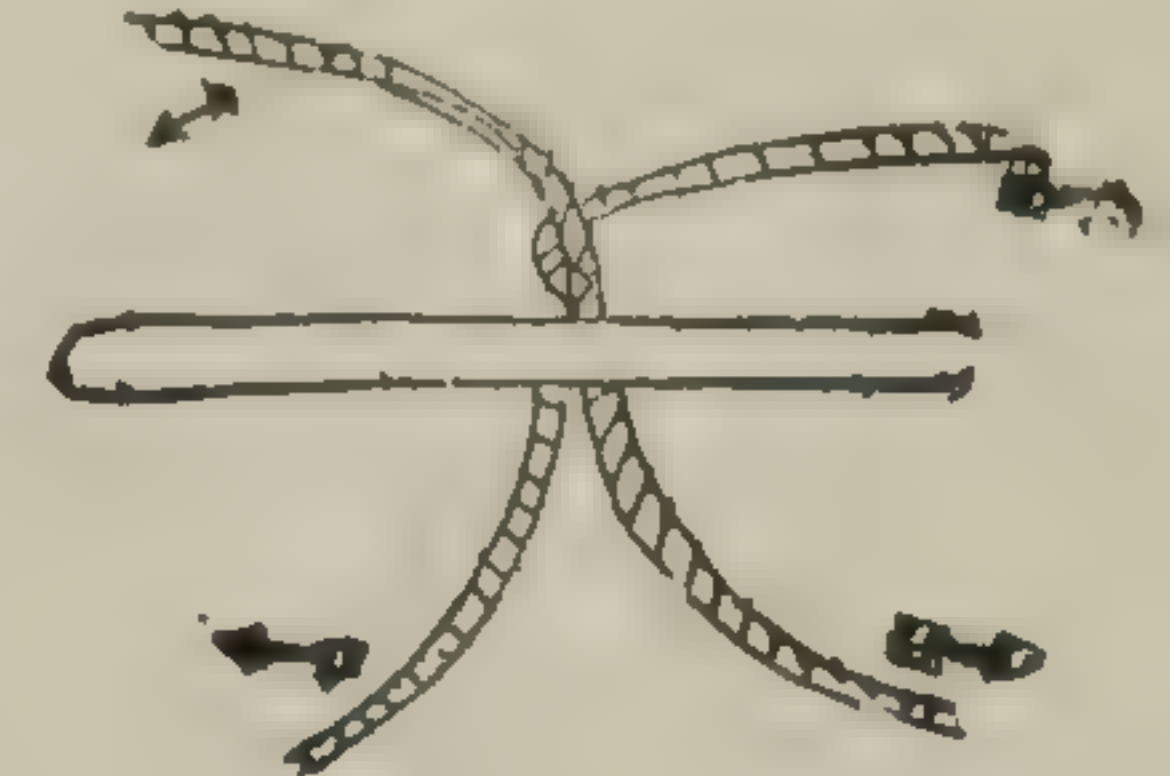
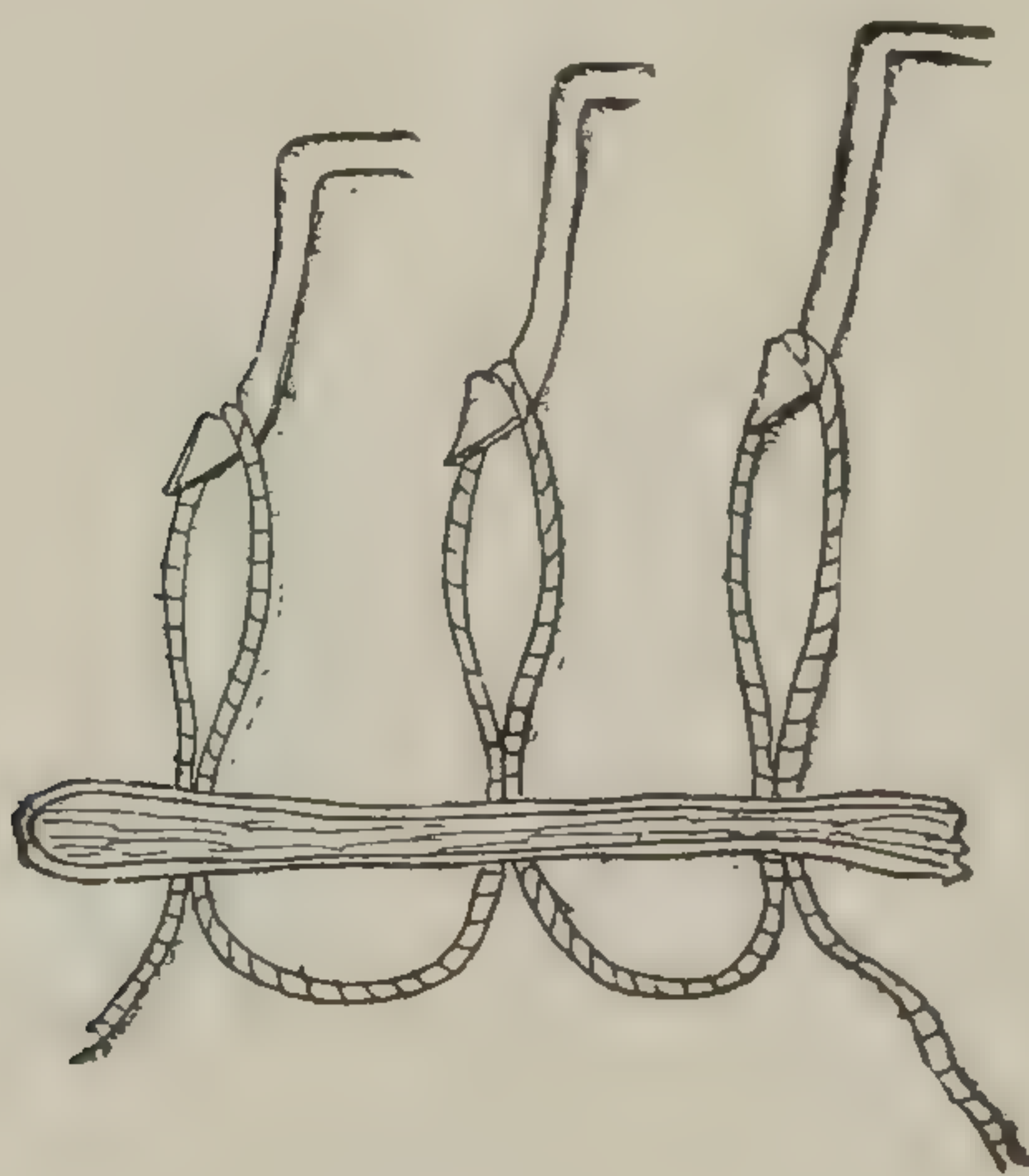
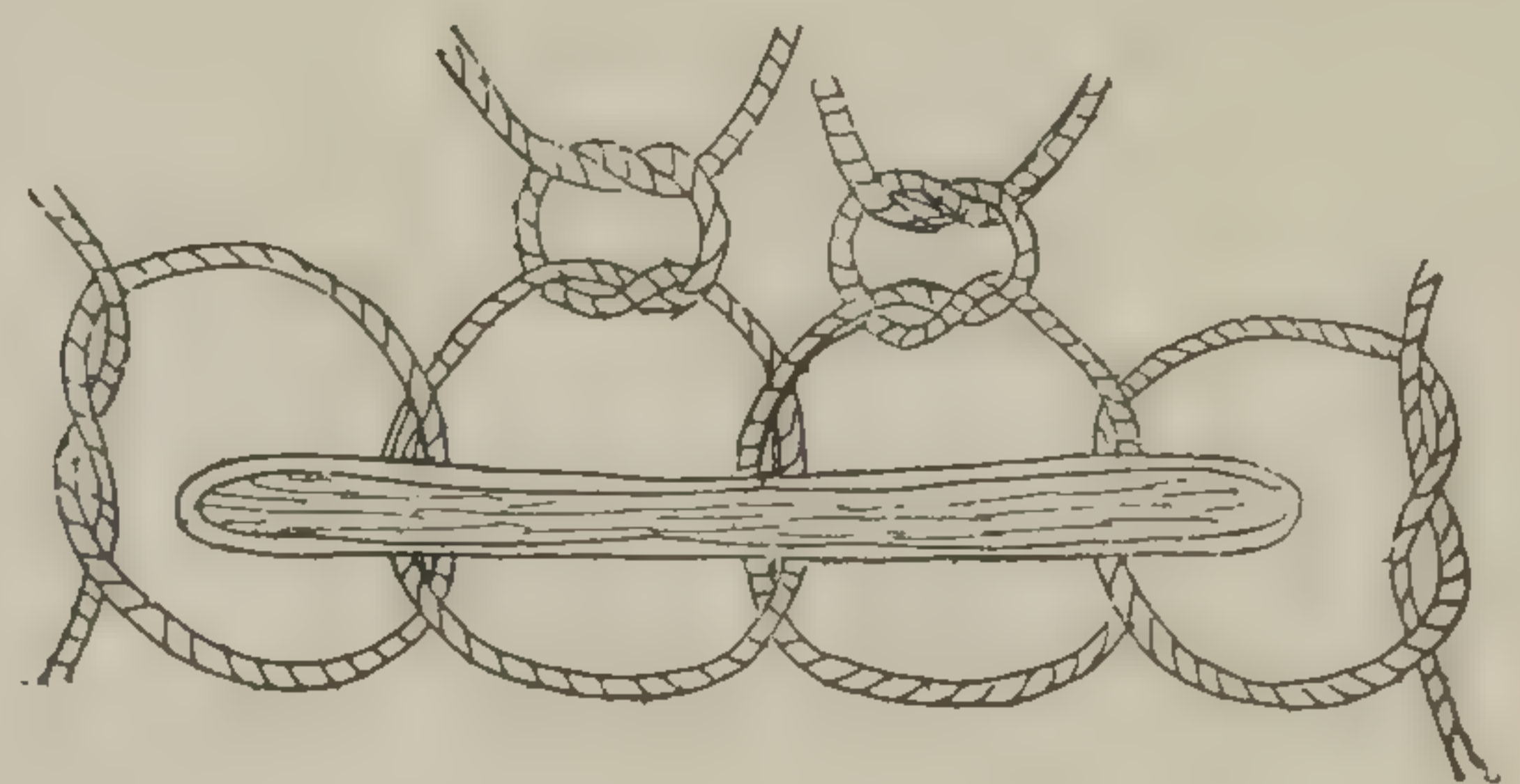


FIG. 14—Ordinary double ligature.

the same, or the double ligature (Fig. 14) should be employed. The latter is most frequently used in this country. In its application it is important to cross the two ligatures so that in tying them the tissues are brought together rather than pulled apart. In case the tissue, which is most frequently a large pedicle of an ovarian tumor, is too thick or broad to be trusted to any of the forms of ligature previously mentioned, *linked ligatures* (Fig. 15)



*a.*



*b.*

FIG. 15—*a.* Linked ligatures. Method of inserting by means of hooked ligature carrier.

*b.* Method of tying the same by the reef knot. Care should be taken that each ligature is linked to the one adjacent.

should be applied in sufficient number to safely include the tissue. In the introduction of these ligatures some form of ligature carrier must be used. Personally, I prefer a somewhat blunt hook.



I have used this (Fig. 16) for a number of years, and much prefer it to any other form of ligature carrier.

The projecting button of tissue left after the application of a ligature does not mortify, as it would upon the surface of the body, but coming in contact with other parts at once contracts adhesions with the development of blood vessels, so that complete reorganization is maintained and with the absorption of the ligature all trace of the traumatism soon disappears.

SUTURING of the bleeding surface can be frequently resorted to with advantage. The continuous suture, preferably of catgut, is that which is ordinarily employed, and its use is most frequent in checking the oozing incident to the enucleation of fibroids in abdominal myomectomy. In the closing of the abdominal incision, or in operating on a lacerated perineum, it is almost always



FIG. 16—Author's blunt hook ligature carrier. Half size. Handle not shown.

possible to check any persistent oozing by the proper introduction of a suture in closing the wound.

THE HOT IRON can be resorted to when other means fail. Once or twice in a lifetime will be probably as frequent an application of this means as any surgeon will be likely to make, but it should be borne in mind that this is a possible means of hemostasis. Any instrument of sufficient size to carry heat, as a urethral sound, or even the domestic poker, can be used. The instrument should be heated to a dull red, quickly wiped on a damp cloth, and lightly applied to the bleeding surface. Where the instrument is at hand, of course the Paquelin cautery is to be preferred, as its use is much simpler and more surgical.

THE TAMPONADE is used in cases in which there is persistent oozing following the enucleation of pelvic tumors. The oozing can be temporarily controlled by the pressure of a sponge, but as



soon as the sponge is removed the oozing is found to re-commence. In these cases, especially if the condition of the patient is such as to require speedy closing of the abdomen, the application of the tamponade is the safest means of controlling this oozing. Two methods are in use: In the first, an opening is made through Douglas's cul-de-sac into the vagina, which has of course been previously sterilized. The end of a broad strip



FIG. 17—Mikulicz drain.

of iodoform gauze is then passed from above into the vagina so that it can be seized with the fingers when its removal is indicated. The remaining portion of the gauze is then passed back and forth across the pelvis and pressed into place. Care should be taken in its application, so that when it is desired to remove it, it can be easily drawn down through the opening in the vagina. The intestines dropping down rest upon this gauze as upon the pelvic floor. Another form of tamponade is that known as the



MIKULICZ DRAIN (Fig. 17). This is inserted in the pelvis for the sake of hemostasis, and also in cases in which it is desirable that the intestines should not descend into the pelvis, owing to the infected condition of the cavity. This drain is introduced from above and is removed through the abdominal incision, left partly open for that purpose. A ligature is fastened to a large piece of iodoform gauze and this piece then pushed down into the pelvis so as to make a pocket. Into this pocket are then passed strips of iodoform gauze, so as to press uniformly and sufficiently upon the walls of the pelvis. The margins of the gauze pocket and the ends of the gauze strips project at the lower angle of the incision, which is then closed down to the gauze. It would be well for the surgeon to note the order in which the gauze strips are passed into the pocket, so that in removing the tamponade they shall be removed in the inverse order.

If the tamponade has been inserted so as to be withdrawn through the vagina, and has been inserted merely to check oozing, it may safely be withdrawn in forty-eight hours. After its removal the vagina should be lightly packed with gauze, so as to prevent infection of the cavity.

The strips of gauze in the Mikulicz drain may be taken out at the end of forty-eight hours if desired, but if the tamponade has been inserted on account of infection, the whole better be left for at least five days. The strips of gauze should then be removed, and the pocket itself withdrawn by drawing on the string attached to the bottom. Even if removal is deferred for two or three days longer the operation is still attended with a good deal of pain, and under ordinary circumstances it should not be undertaken except under an anesthetic. In case the tamponade has been used on account of danger of infection, or because of inability to entirely remove a cyst wall, it will be necessary to reintroduce a few strips of gauze so as to still keep up drainage of the cavity. This should be removed daily, or on alternate days, a less amount being inserted each time, until the cavity heals from the bottom.



## CHAPTER V.

### DRAINAGE.

**D**RAINAGE in abdominal surgery has unquestionably been very much overdone during recent years. Within the last two years there have been evidences of a decided reaction, especially in certain quarters. At one time some operators drained in nearly all their cases. No matter how simple the operation, a drainage tube was put in and allowed to remain for at least a few hours. A few operators still cling to this custom, but most have found that the disadvantages of the drain far more than compensate for its advantages in the vast majority of cases. The presence of the drain, whether a strip of gauze be used or a rubber or glass tube, invariably leaves a weak spot in the abdominal wall, which is very liable to serve as the starting point of a hernial protrusion. The chief objection, however, to the presence of the drain is, that it leaves an open channel for infection for hours, it may be days, after the completion of the operation. The management of the drain must necessarily be left in the hands of an assistant, or more frequently a nurse, and no matter how carefully the latter may be trained, there is constant risk of some break in the chain of asepsis. Personally, I have never been an advocate of drainage, and have only drained under unusual circumstances. For the last two or three years I have probably not drained to exceed a half dozen cases, and in nearly or quite all of those I have drained through the vagina and for conditions in which it seemed to me drainage was imperative.

At the present time drainage, among advanced abdominal surgeons, is seldom resorted to, and practically only in cases in which the oozing from a denuded surface is too great to be trusted to the absorptive powers of the peritoneum; in which a piece of cyst wall, or other tissue of doubtful asepsis, must be left behind, or in which there has been an injury to the bladder,



bowel, or some other viscus, and the operator considers it unwise to trust implicitly to his sutures and aseptic technique. In these cases drainage may be regarded as the less of the evils. In only the first of these cases is it safe to use a simple tube or capillary drain. In the other conditions some form of tamponade is essential for safety.

In cases in which abdominal drainage is used, every care must be taken to avoid infection so long as the drainage remains



FIG. 18.

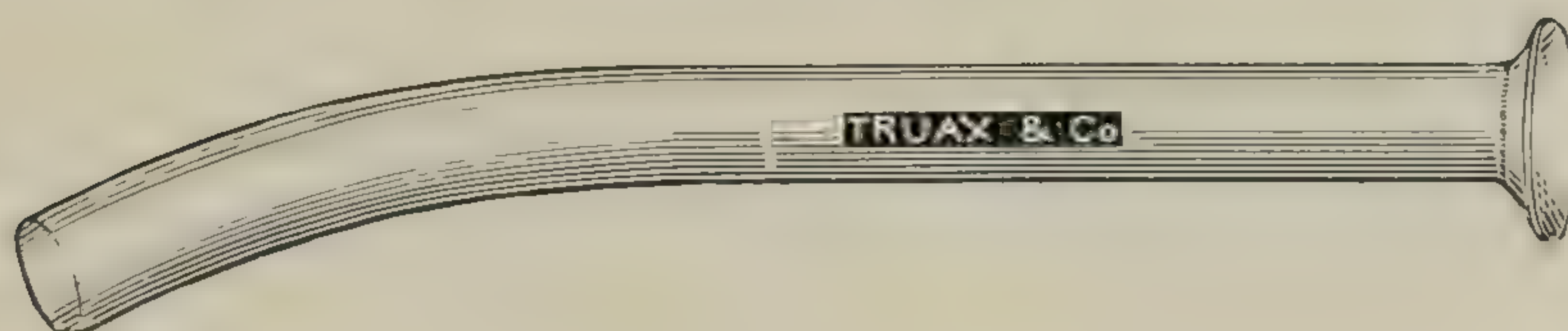


FIG. 19.

Glass drainage tubes.

*in situ*. If the glass tube (Fig. 19) is used, it should be carefully introduced to the bottom of the pelvis behind the uterus. Care should be exercised that it does not press upon the tissues at the bottom, as harm may easily result from such pressure. The tube should be lightly wrapped with a layer of iodoform gauze, and a wisp of the gauze should be passed through the tube down to the bottom, so as to secure capillary drainage. The protruding end of the tube should be surrounded by gauze or absorbent cotton, the other dressing being protected by a piece of rubber dam slipped over the flange of the tube. These absorbing dressings



FIG. 20. Syringe for cleaning drainage tube. Can have small rubber tube slipped over the nozzle if desired.

should be changed at frequent intervals, the gauze drain being withdrawn from the tube, and the tube itself cleaned either by a small syringe attached to a rubber tube (Fig. 20), which can be



passed to the bottom, or by means of a slender forceps holding a small wisp of absorbent cotton. If the tube shows too profuse hemorrhage, it may be necessary to withdraw it and reopen the abdomen to find the bleeding point. If, on the contrary, the amount of blood and bloody serum progressively diminishes, the tube may, with safety, be withdrawn at the end of twenty-four or forty-eight hours. A stitch is usually introduced at the time of closing the incision, at the point where the drainage tube is to be inserted, so that on withdrawing the tube this stitch may be tied and the closure of the abdomen thus completed.

In providing for vaginal drainage the vagina at the completion of the operation should be lightly packed, below the strip of gauze introduced from within the pelvis into the vagina, with pieces of iodoform gauze which shall serve to absorb the fluids discharged through the original drain. At the entrance of the vagina there should be inserted a pledget of absorbent cotton covered with vaseline, so as to prevent soiling of the gauze by urine during catheterization. It is well to instruct the nurse to replace this with a fresh piece of cotton after each catheterization. The gauze should be removed as often as it becomes soiled from the discharges above, and fresh gauze inserted. The entire drain may be removed at the end of forty-eight hours in cases in which it has been inserted merely because of oozing, and in which there is no danger of prolapse of the bowel following its withdrawal. Where this danger exists the gauze should be allowed to remain at least five days. If drainage has been inserted because of incomplete removal of questionable material, it will probably be necessary for it to be continued for ten days or two weeks. With each daily cleansing of the cavity a smaller amount of gauze should be introduced, until healing of the cavity takes place from the bottom.



## CHAPTER VI.

### CATHETERIZATION.

**I**N the after treatment of operation cases requiring catheterization, the comfort and well-being of the patient depend very largely upon the skill and care with which this little operation is performed. Every nurse should be carefully instructed in the technique of the use of the catheter.

The hands of the nurse must be as carefully sterilized as for a capital operation. The vulva and meatus should be then thoroughly cleaned with soap and water and bi-chloride solution (1-1,000). The catheter should be of glass (Kelly) or of soft rubber. In either case the instrument should have previously been sterilized beyond suspicion, by either boiling for a sufficient length of time or by being immersed in a reliable antiseptic. The sterile catheter should then be introduced through the sterile meatus, and with sterile hands, with the utmost gentleness. The urethra and bladder are frequently very sensitive, and a slight bruise or abrasion may lead to very serious results. The part should be thoroughly exposed under a good light, so that the introduction may be constantly under the eye of the nurse. Unless the condition of the patient requires its more frequent use, the catheter should not be employed oftener than four times a day. With many patients even three times is often enough.

CATHETERIZATION OF THE URETERS is now recognized as a procedure of occasionally great importance. The operation is many times exceedingly difficult, and in some cases is unquestionably impossible of performance, owing to a contraction of the mouth of the ureter.

The operation itself is by no means devoid of danger, as a number of cases have been reported in which serious consequences have followed the introduction of septic infection into the ureter from the passage of the ureteral catheter through an infected



bladder. It is probably safe to say that, except in unusual conditions, the loss of time and inherent risks of the operation more than counterbalance its advantages. Dr. Howard A. Kelly, of

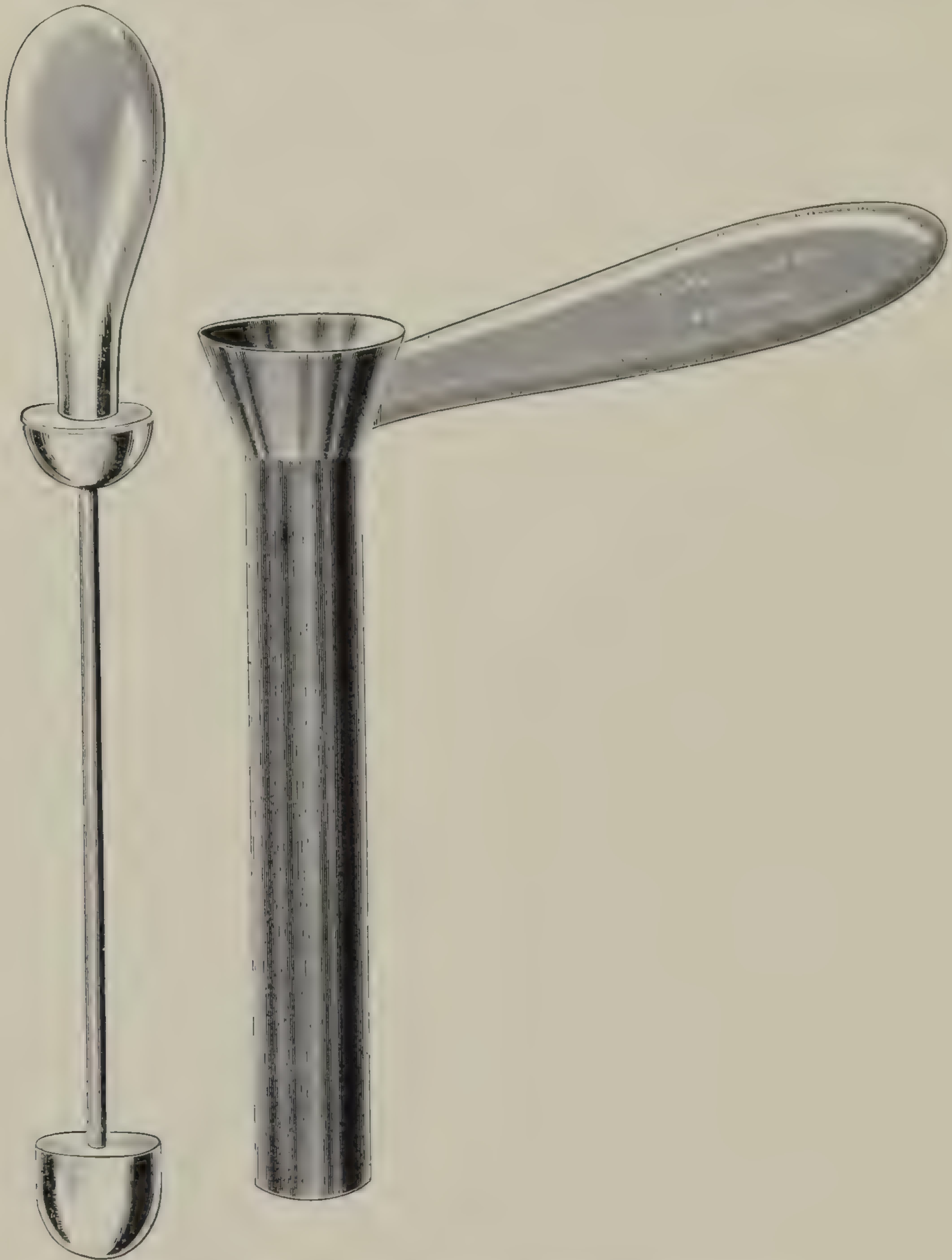
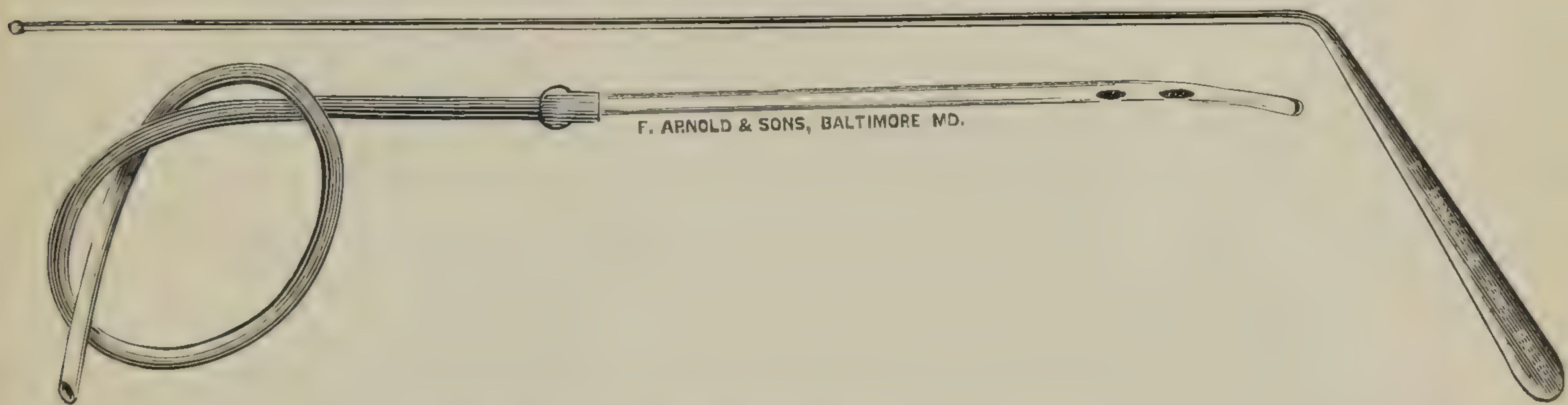


FIG. 21. Kelly's instruments for ureteral catheterization.  
Urethral speculum and obturator.

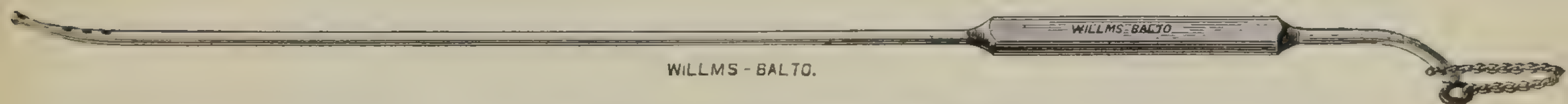
Baltimore, has done more than any one else in this country to develop this method of examination, and his directions for its performance may be briefly summarized as follows (Fig. 21):



The vulva and meatus are carefully sterilized and the urethra dilated by metallic dilators up to ten or twelve millimeters. This dilatation can easily be accomplished without much pain under cocaine anesthesia. The bladder is now catheterized and the patient at once placed in the knee-chest position. A speculum, as large as the urethra will receive, is then introduced, when, on withdrawing the obturator, the bladder becomes distended with air, and by means of a good light, preferably an Argand burner or electric light, the entire interior of the bladder can be inspected. The handle of the speculum is depressed until the intra-ureteric



Searcher to find opening of ureter and flexible catheter.



Metallic ureteral catheter. (Half size.)

ligament comes into view. This is often indicated by a slightly elevated ridge of mucous membrane. By then turning the speculum to one side, at an angle of about thirty degrees, the ureteral orifice should be within the field of vision. This orifice sometimes appears as a dimple, or a small hole, or as simply a crack in the membrane. It is sometimes necessary to watch until its location is indicated by a jet of urine. When the orifice has been found, the ureteral catheter is introduced an inch or two and the urine collected, or for diagnostic purposes a small bougie may be passed to the pelvis of the kidney. In cases in which the patient is too weak to assume the knee-chest posture, or in which,



for any other reason, such a position is undesirable, she may be placed in the dorso-sacral position, with the hips resting on firm pillows. The accompanying cuts illustrate the technique.

Harris, of Chicago, has recently devised an instrument for



Cut showing speculum in position and operator using the searcher.

obtaining the urine from each kidney separately, which is much simpler in its manipulation than the ureteral catheters of Kelly. No anesthetic is required in its use, nor any special technical skill. The instrument consists of two catheters placed side by



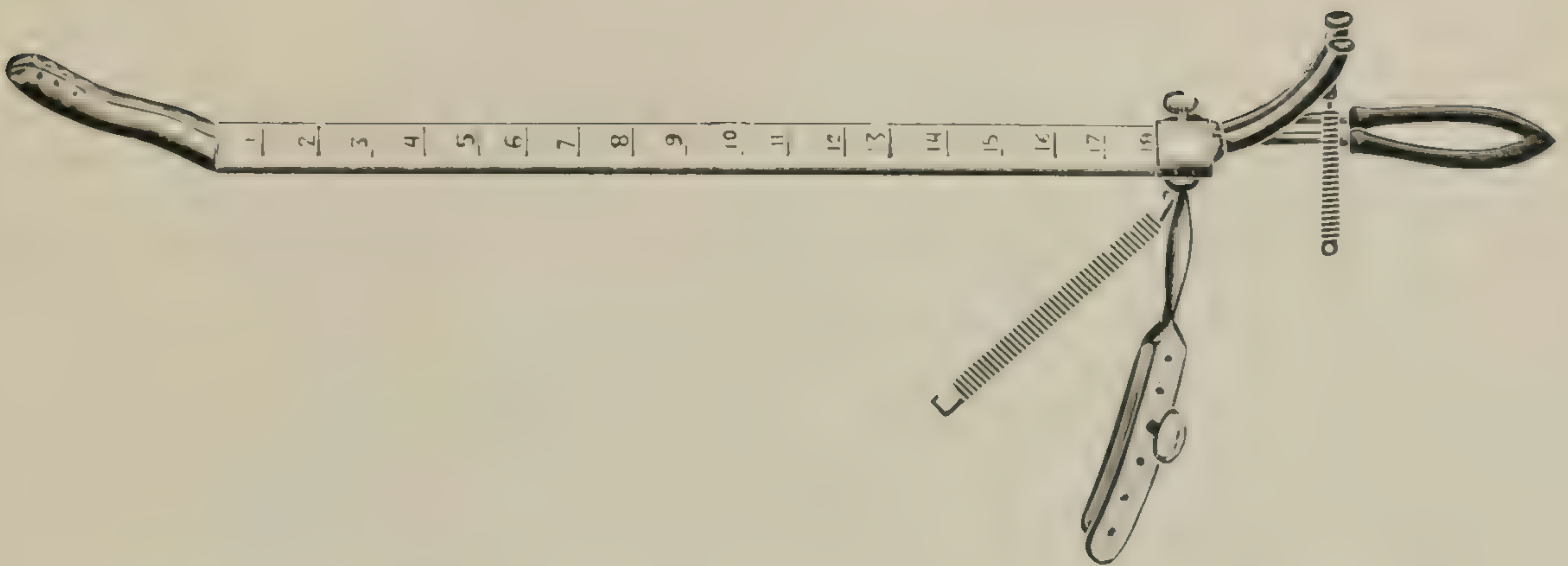
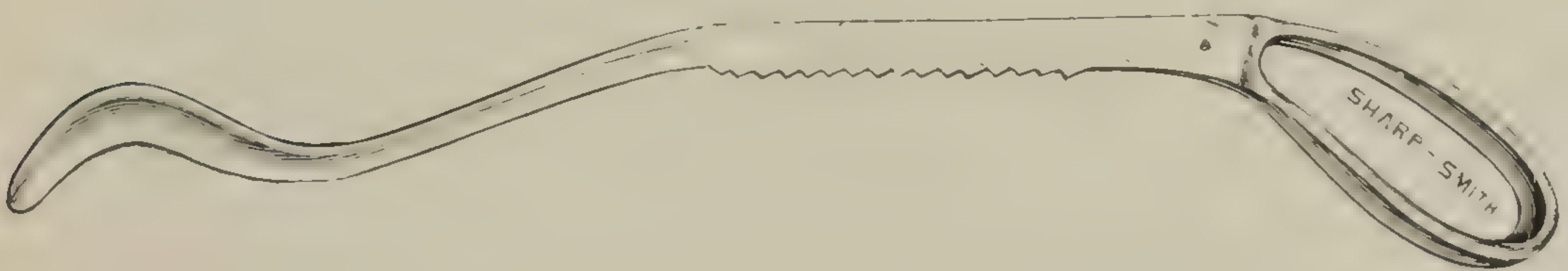
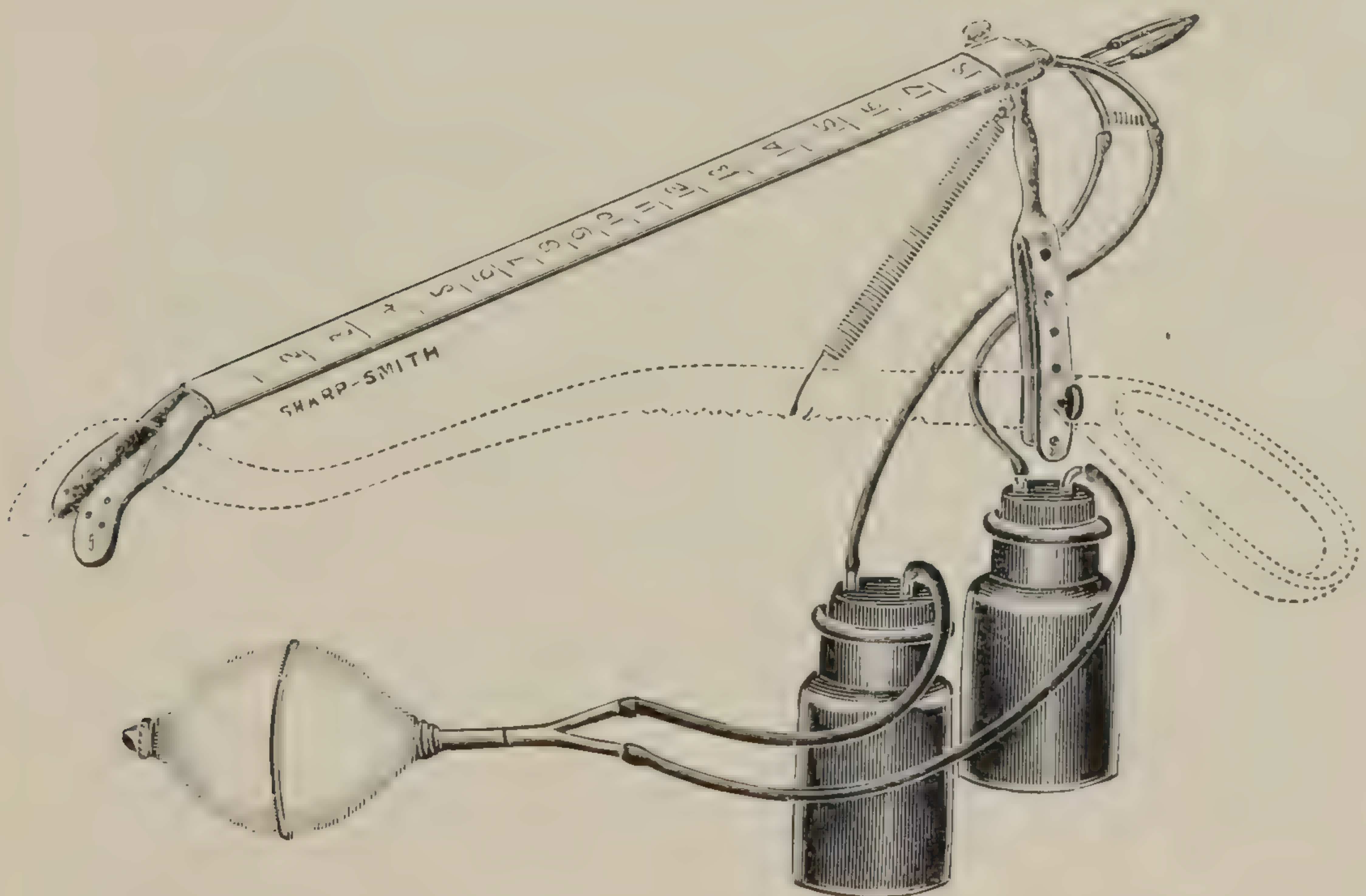


FIG. 22. The Harris instrument for obtaining the urine from each ureter separately.  
The instrument ready for introduction into the bladder.



Lever for lifting up base of bladder through the vagina in the female, or rectum in the male.



Halves of instruments separated and bottles attached for collecting the urine.



side and inclosed in a common flattened tube. Having been introduced into the bladder in the position shown in Fig. 1, the catheters are separated from each other, as shown in Fig. 2. The lever (Fig. 3) is then introduced into the vagina and pressed up between the ends of the catheters, so as to divide the vesical floor into two portions, into each of which one ureter discharges, the contents of each being drawn off by each catheter separately by suction by means of the rubber bulb.



## CHAPTER VII.

### EXAMINATION OF PATIENTS.

THE positions in which the surgeon may be called upon to examine patients are the erect, dorsal, Sims', knee-chest and knee-elbow. Before undertaking any examination of importance it is desirable that the intestines should have been previously emptied by a purgative and that the bladder should have been emptied immediately before the examination. The clothing should be loosened and the confidence of the patient so far obtained that there will be no unnecessary rigidity of the abdominal muscles.

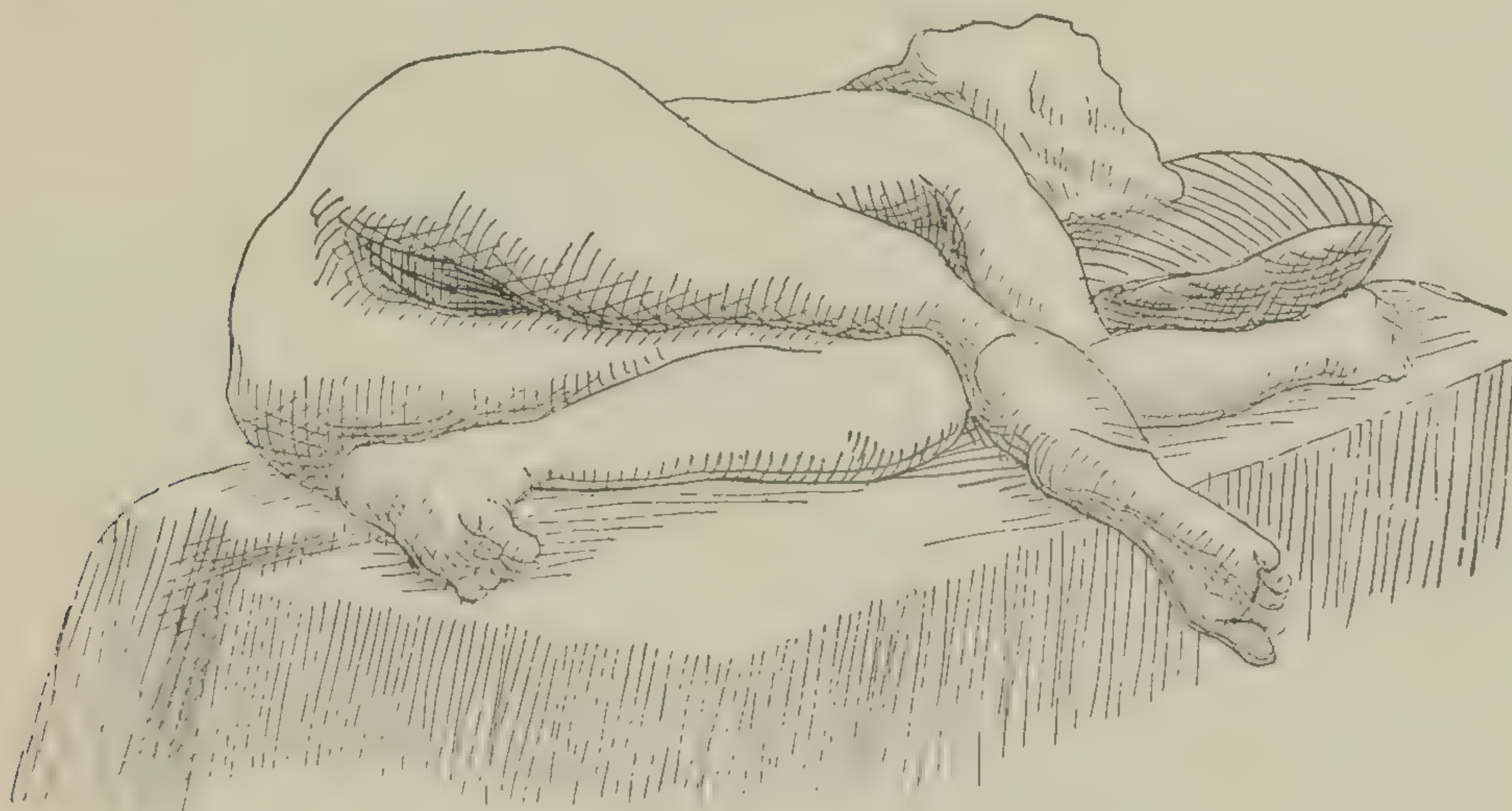


FIG. 23. Diagram showing the Sims position.

THE ERECT POSITION is of use chiefly in determining the amount and character of prolapse. It frequently happens that all evidence of prolapse will disappear as soon as the patient is recumbent. On having her stand, however, and on directing her to "bear down," the displacement will be at once manifest. The further use of this position is chiefly in determining the proper adjustment of a pessary. After introducing a pessary and satisfying himself that it is a suitable fit, the operator should direct the patient to walk a few times up and down the office or



room, and should then re-examine her while standing, as he can thus best determine whether or not the pessary is still in proper place and rendering suitable support to the uterus.

THE DORSAL POSITION is that which is most frequently directed in examining patients, especially in making the ordinary bi-manual examination. If necessary, the head and shoulders may be supported on pillows, and also the hips, so as to relax to the utmost the abdominal muscles. The patient should lie upon a firm lounge or bed, or preferably upon a table, as in this latter more elevated position the parts are more easily reached by the

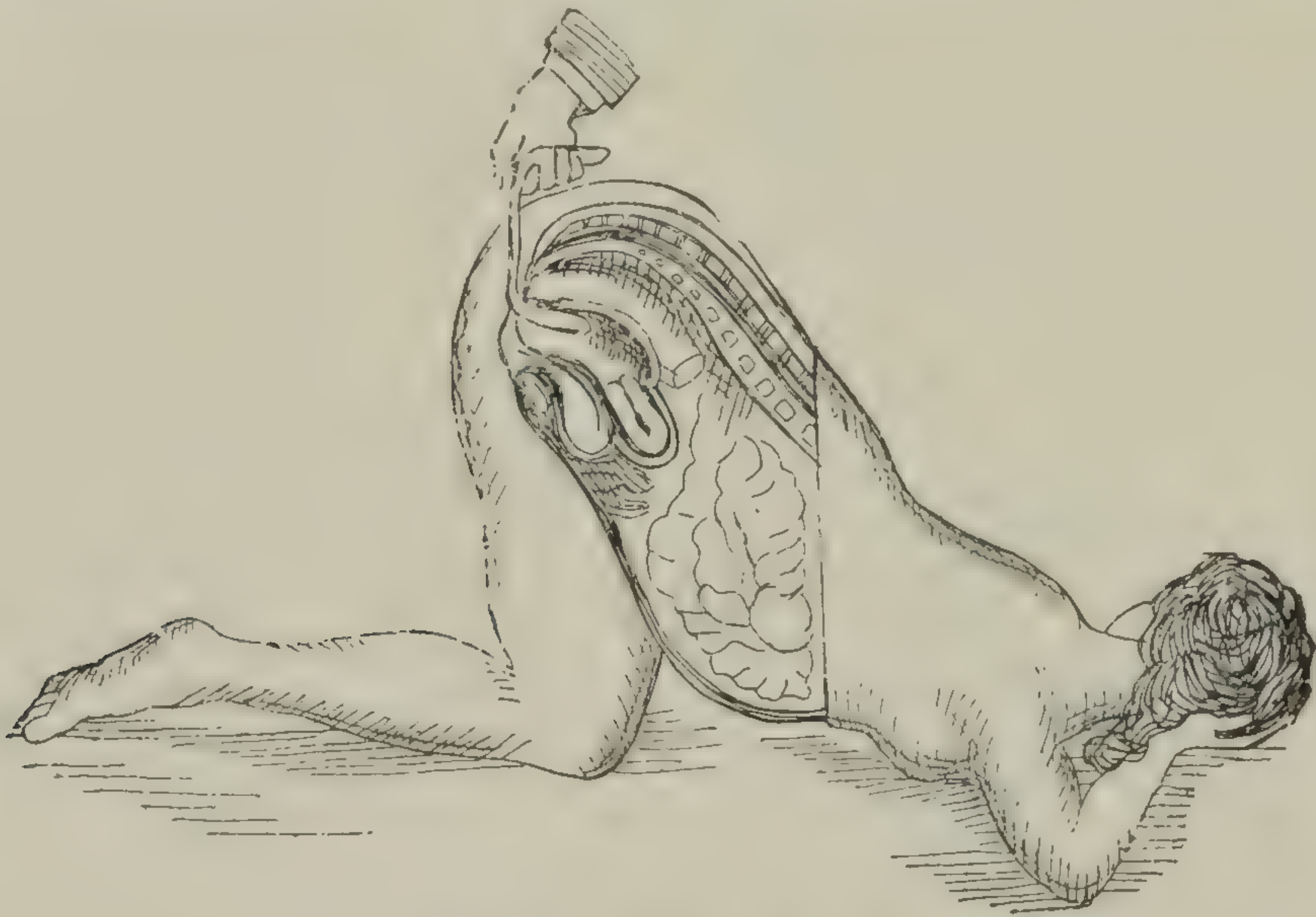


FIG. 24. Diagram showing knee-chest position.

examiner. Complicated gynecological chairs and tables are entirely unnecessary, and are many times objectionable to patients.

THE SIMS' POSITION (in which the patient lies upon the left side in a partially prone position, with the left arm thrown back of the trunk and both knees drawn up, but the right one farther than the left,) is of use chiefly in examining the vagina in cases of vesico-vaginal fistula, and in operating on the same. (Fig. 23.)

The knee-chest and knee-elbow positions are used chiefly in securing reposition of a retrodisplaced uterus, in packing the vagina to support the same in proper position, and in introducing a pessary. (Fig. 24.)



The exaggerated dorsal, or lithotomy, position is usually resorted to in operations upon the vagina or perineum. This position is maintained by the use of some form of leg-holder, either one attached to the table or one in which the thighs are supported by a strap passing diagonally across the back under one shoulder and over the other and attached to bands fastened above each knee.

THE VAGINAL TOUCH is practiced with the index finger, or index and middle fingers, introduced into the vagina. The hand should be first carefully washed and the fingers annointed with vaseline or some other unguent. If the conditions are favorable, it is well to have had the vagina sterilized before making the examination. The finger or fingers should be introduced carefully, so as to avoid the infliction of pain as far as possible. An awkward introduction of the finger sometimes vitiates the entire examination by frightening the patient, who thereafter is in constant dread of the further infliction of pain. The fingers should be introduced with the palm up, the thumb being kept straight and turned toward the opposite genito-crural fold. The remaining fingers are flexed and serve to press up the perineum, so as to permit the examining fingers as free entrance as possible into the pelvis. With the introduction of the fingers the examiner is able to determine the condition of the perineum, of the hymen or its remains, the vaginal walls, and the urethra. As the fingers pass up, the cervix is found and ordinarily the position of the uterus can be determined. Any especially tender spots will be easily located. The condition of the os, and, in any case of sufficient patulousness, of the cervical canal, can also be ascertained.

The ureters can sometimes be palpated through the vagina. The examining finger should be introduced into the vagina and passed to the cervix. As it is then drawn down along the anterior vaginal wall the posterior edge of the trigone will be felt about a half inch below the cervix. After locating this ridge the finger can be passed to each end, where it will detect the cord-like



ureter passing upward and backward toward the sacro-iliac joint. The detection of the ureters, when entirely healthy, is not so easy as is their determination when thickened by tuberculous deposit. Under such circumstances the ureter may be distinguished as a hard cord nearly as large as a lead pencil, running upward along its usual course.

BI-MANUAL EXAMINATION is an essential part of the vaginal touch. In this the disengaged hand is placed above the pubes



FIG. 25. Diagram showing b.-manual examination of the pelvic contents.

and the pelvic contents pressed down so that the fingers within the vagina may be brought into intimate contact with all the pelvic viscera. The manipulation should be made systematically, so that the fingers examine the anterior and posterior cul-de-sacs and both broad ligaments. If the uterus is retroverted and not adherent it can easily be brought forward by conjoint manipulation and the examination completed. If the abdominal walls are of normal laxity and thinness it is possible in this way to arrive



at very accurate conclusions as to the conditions of the uterus and its appendages. In obese subjects the examination is rendered more difficult, and in those that are very obese it may be impossible without an anesthetic to arrive at any satisfactory conclusion. There is usually, however, in such subjects a fold a little above the pubes, below which the abdominal walls are thinner and the fingers can be pressed into the pelvis at this point. It is

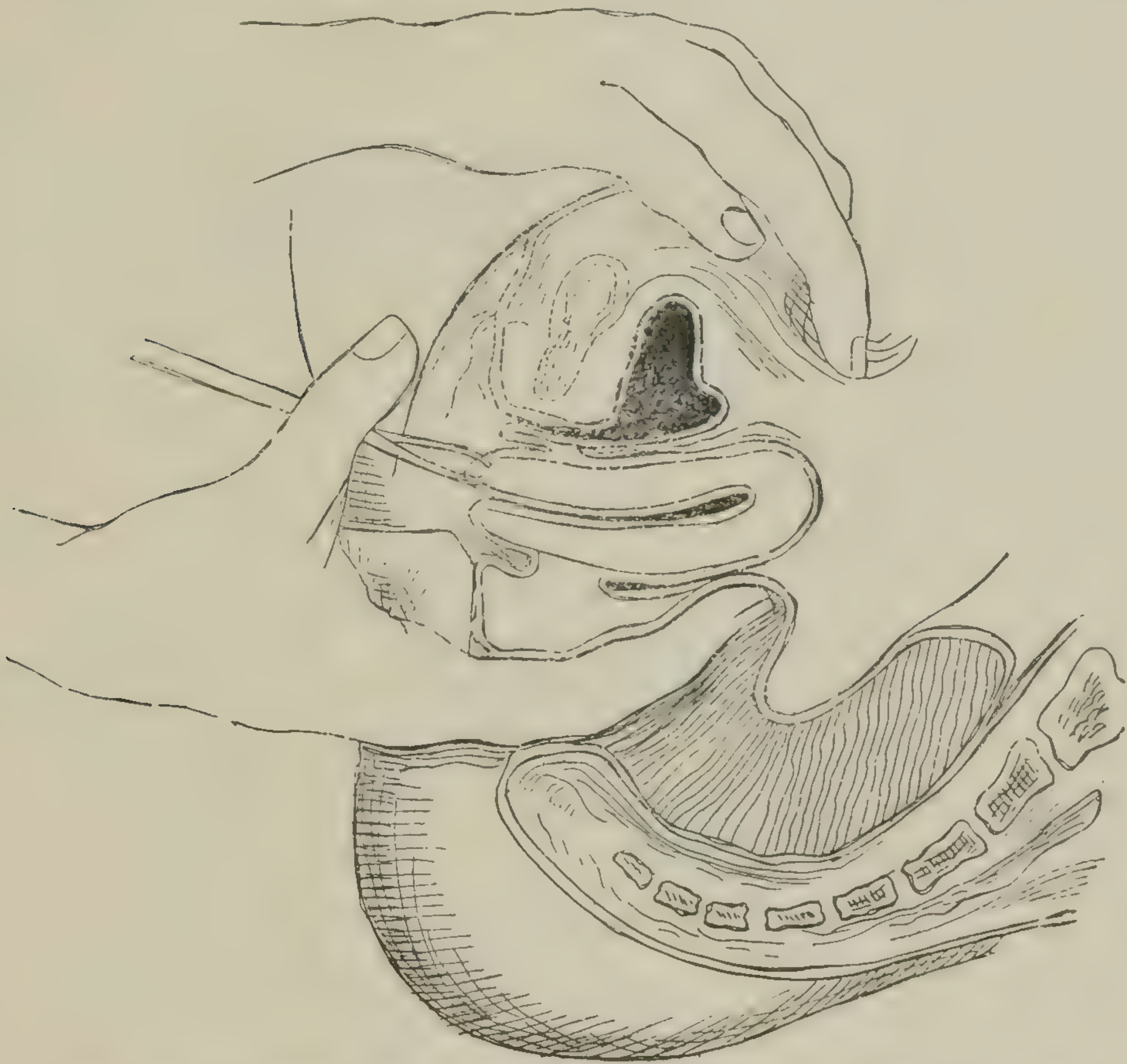


FIG. 26. The same showing examination by means of finger introduced into the rectum the uterus being drawn down by volsellum.

sometimes advantageous to have an assistant draw the uterus down by a bullet forceps caught in the cervix.

Careful and conscientious surgeons will seldom find it necessary to make a vaginal examination of virgins. The natural modesty of such patients should always be respected, and an examination of that character should be instituted only as a last resort. Whenever examination is finally found indispensable, it



should uniformly be conducted under an anesthetic, as without it, owing to the tenderness of the parts, any satisfactory examination will be impossible. By using it the parts are entirely relaxed, so that the examination may be made as thorough as necessary, and at the same time the feelings of the patient are not outraged. Rectal examination in these cases can almost invariably take the place of the vaginal. The condition of the os and the cervix can be well ascertained by the rectal touch, and at the same time the condition of the uterus itself and its appendages can be much more thoroughly and satisfactorily ascertained. The importance of maintaining the integrity of the hymen cannot be over-estimated, and in cases in which some local examination or visual inspection of the cervix is necessary, the parts can usually be sufficiently exposed through a speculum so small as to produce no laceration, while at the same time it will permit all necessary manipulations.

RECTAL TOUCH is sometimes necessary, especially in examining virgins. In any case it is possible through the rectum to reach higher up on the posterior uterine wall than when examining through the vagina. In making this examination the uterus should be drawn down by a bullet forceps, or strong tenaculum, held by an assistant, when the examiner's fingers can, without much difficulty, explore the entire posterior surface of the uterus. A sub-peritoneal fibroid as small as a buckshot can be easily found by this method of examination. It is possible, also, to palpate, usually with great distinctness, the ovaries and the entire posterior surface of each broad ligament. This method of combined manipulation is of the utmost value in gynecological diagnosis.

VESICAL TOUCH is rarely necessary. It is resorted to chiefly in conditions of vesical disease, and in cases of atresia of the vagina, combined with the rectal touch, to determine the presence and condition of the uterine body above. It is also resorted to to ascertain whether or not the bladder walls are involved in a case of cancer of the cervix. This examination can only be



made under an anesthetic. It should be preceded by dilatation of the urethra by suitable dilators; then the index finger, if not too large, can be carefully insinuated and the entire bladder wall explored. If the examiner's index is too large the little finger should be used. With care there is very little risk of vesical incontinence of more than a few hours' duration following this examination.

VAGINAL SPECULUMS. Three distinct forms of vaginal



FIG. 27. The Ferguson speculum.

speculum are in use. The cylindrical, or Ferguson's (Fig. 27), which is of value chiefly in making applications to the cervix or

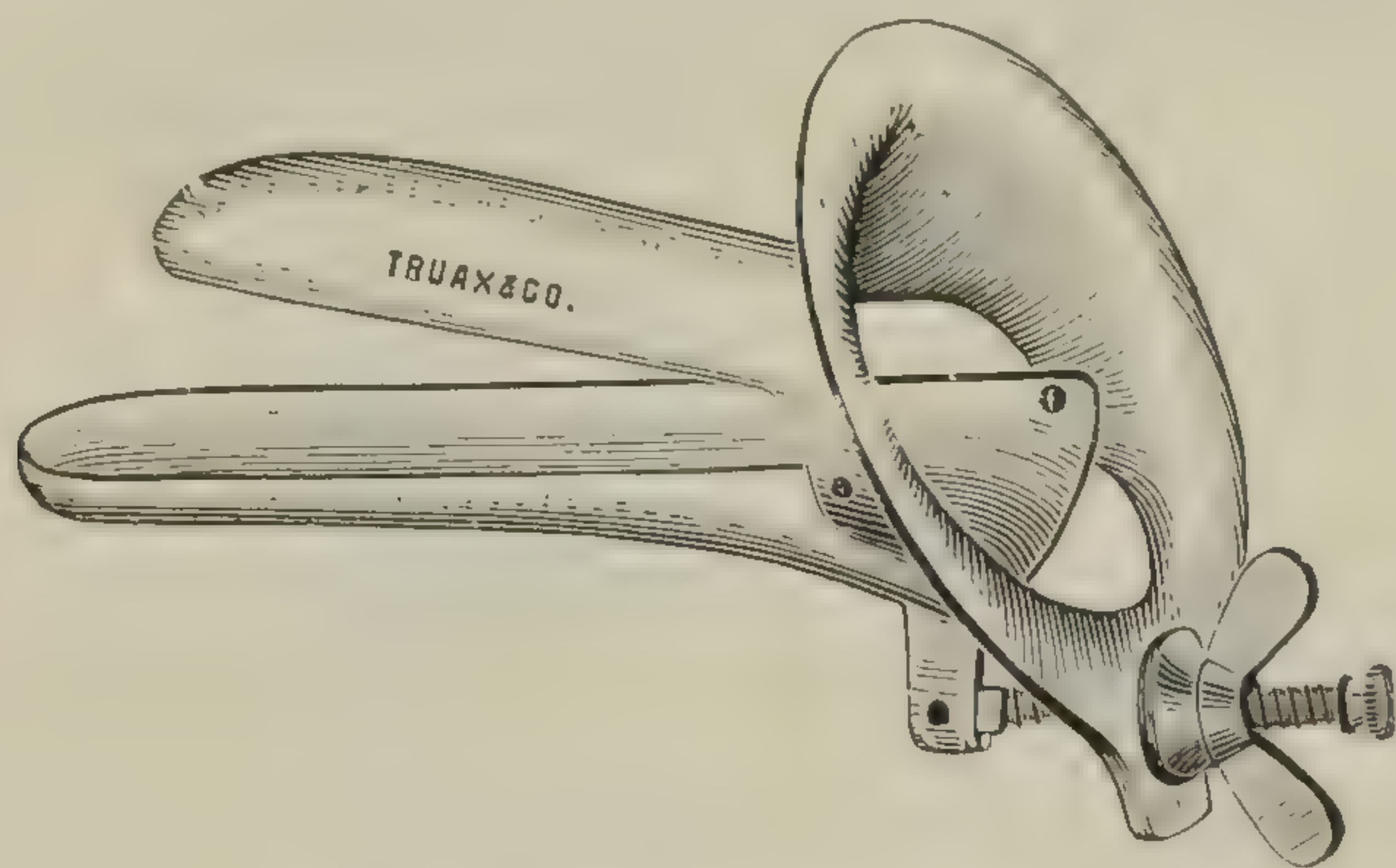


FIG. 28. The Higby speculum.

uterine cavity; the bi-valve, of which the Higby (Fig. 28) and Brewer may be taken as types, of use chiefly in examining the condition of the os; and the univalve, of which the Sims is the type. Various modifications of these are in the market, some of which possess under certain circumstances distinct points of advantage. When one has a limited number of assistants, the Sims speculum with the flange, suggested by Munde, will be of value; as also the self-retaining weighted perineal retractor (Fig. 30), or the self-retaining retractor of Gilliam (Fig. 31); but when one has



an abundance of intelligent assistants, the ordinary instruments are more satisfactory.

In the every-day work of the gynecologist the vaginal specu-

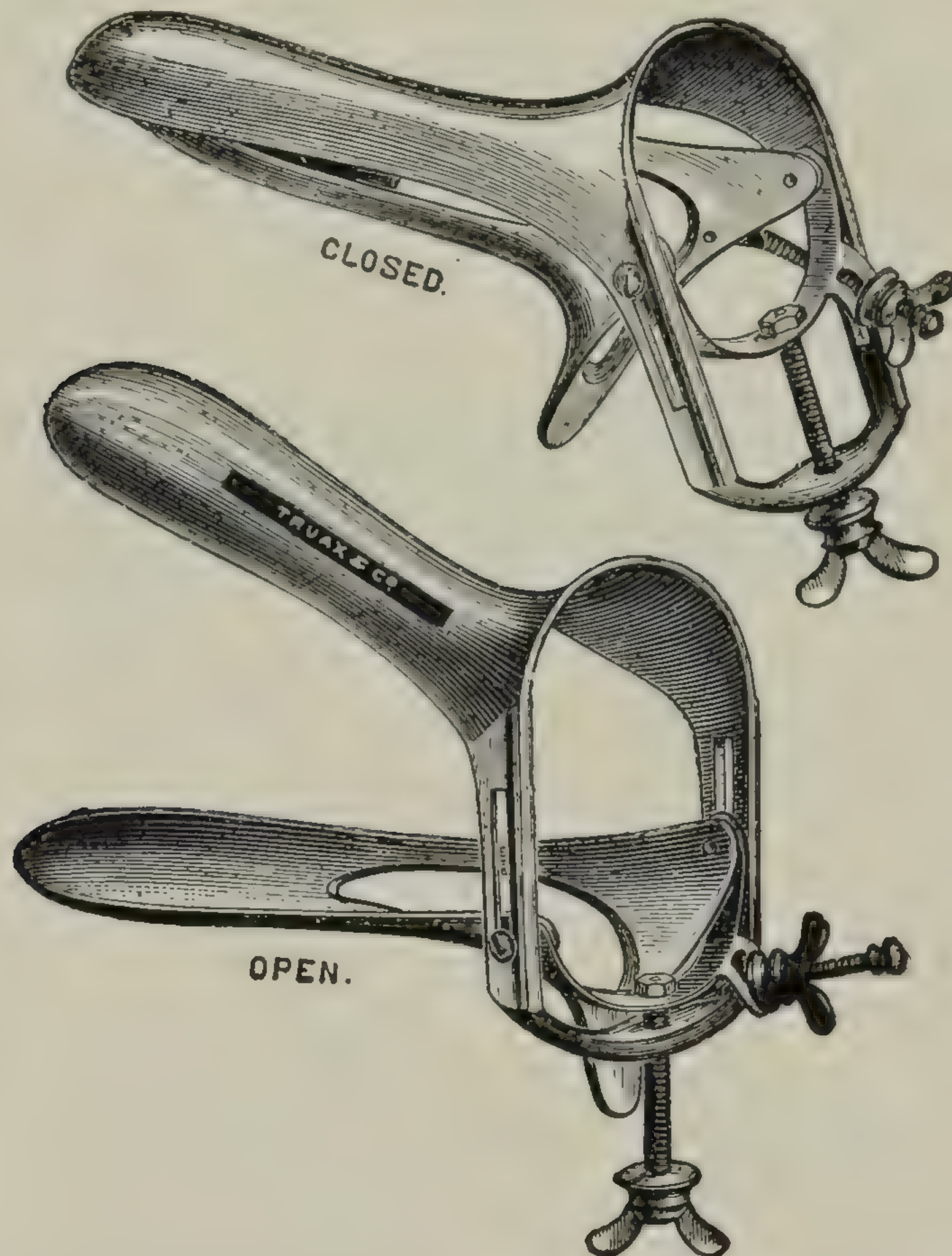


FIG. 29. The Brewer speculum. The cuts as above shown are represented as bottom side up.

lum is of very little use. In making a diagnosis it is almost entirely valueless. The cylindrical variety, or the bi-valve, can be used occasionally in those rare cases which will be benefited by local treatment. The bi-valve can also be used occasionally to demonstrate to some friend the existence and character of a laceration of the cervix; but aside from these purposes the speculum is an almost valueless instrument, and its use would probably be limited to a half dozen times a year.

One great source of error in diagnosis is that the physician uses the speculum rather than the conjoint manipulation. With the speculum he thinks he sees an ulcerated surface, which he pro-



ceeds to treat for weeks or months until finally the suspicion dawns upon him that he has been wasting valuable time in treating a malignant disease. Had he used his fingers in the first place, the peculiar hardness of the surface would have probably enabled him to arrive at a very early diagnosis when the opportunity to save the patient by operative procedures would have been infinitely better than at the time of his diagnosis arrived at by the speculum examination. In other words, the finger will



FIG. 30. Weighted perineal retractor.

make a diagnosis much sooner and much more thoroughly than the eye. In determining conditions deeper than the mere surface the speculum is entirely valueless.

There are certain adjuncts which are of more or less value in examining cases of uterine disease.

THE TENACULUM AND BULLET FORCEPS (Fig. 32) are of use in drawing the uterus down to reach the examining finger.

THE UTERINE SOUND (Fig. 33) was originally designed to determine both the direction of the uterine canal and also its



depth. By means of conjoint manipulation, however, the direction of the canal can usually be much better determined, at least much more safely, than by the use of the sound. Occasionally, however, the instrument can be used with advantage. It should

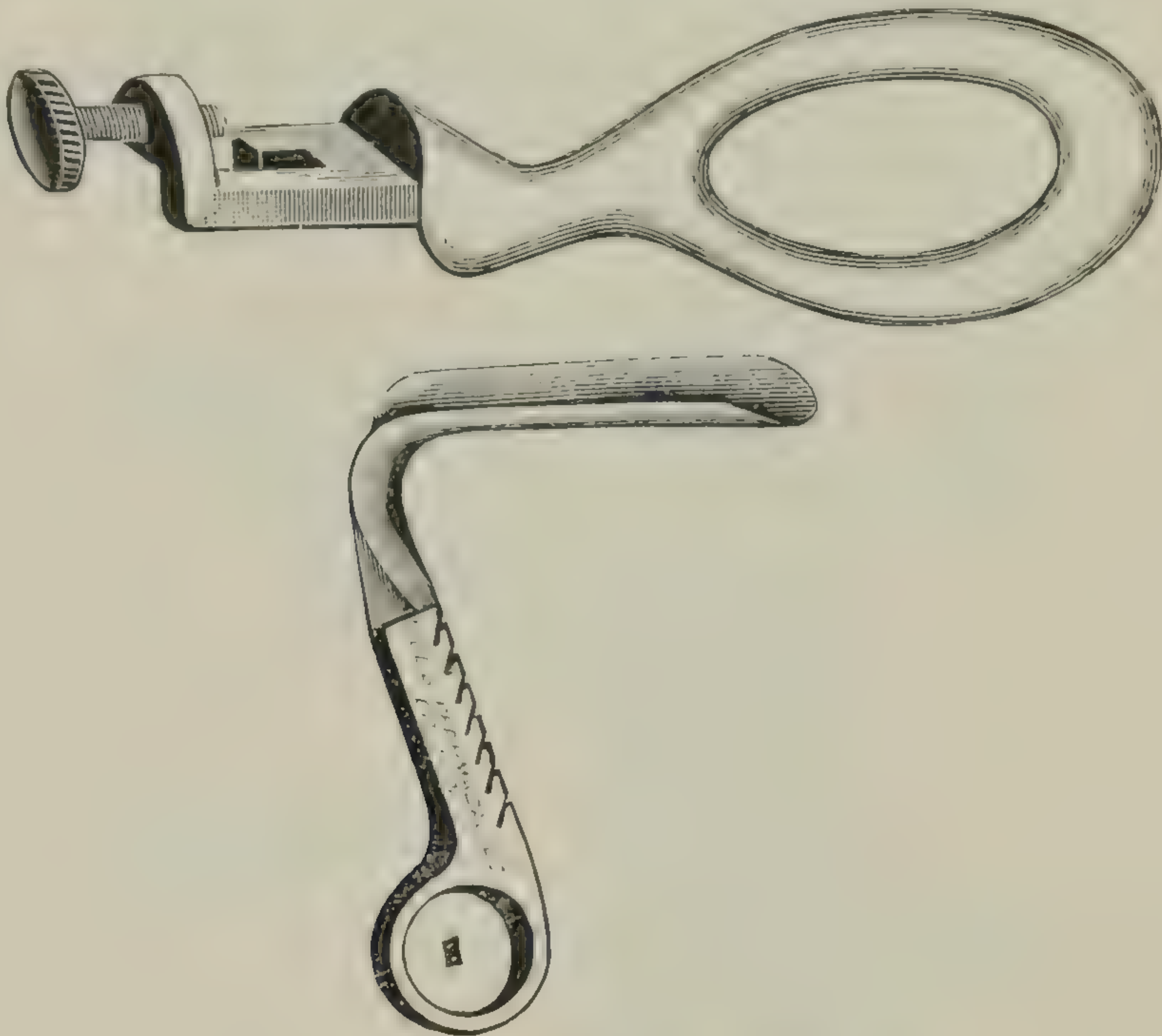


FIG. 31. Gilliam's self-retaining perineal retractor.

be made of silver or pure copper, so as to be quite flexible and at the same time sufficiently rigid. It is a dangerous instrument and should only be used under strict aseptic conditions. The

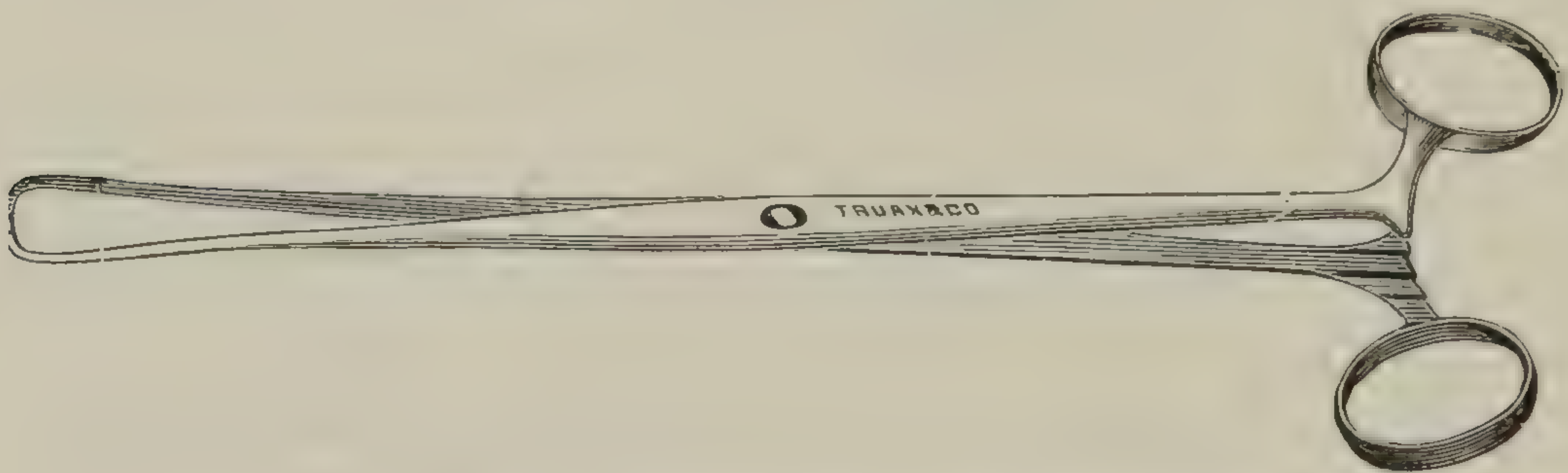


FIG. 32. Bullet forceps to exert traction on the uterus.

vagina should be sterilized, and also the cervix, and the sound itself should have been boiled before using. These precautions, combined with delicacy of manipulation, will probably preserve the patient from harm in making the examination. An examiner



who has become skillful in bi-manual examination will probably find occasion to use the sound not more than once or twice a year. For myself I have not used one for examining purposes for ten years. It is of great importance that before using the sound the operator should convince himself that the patient is not pregnant. Many abortions have been unwittingly produced by carelessness in this regard. Patients are sometimes purposely inexact in



FIG. 33. The uterine sound.

their statements as to previous menstruation, and the examiner must be on his guard against those who resort to this means to secure a desired abortion.

Great delicacy of touch is essential in the safe use of the sound. The uterus is frequently quite soft and friable in structure, and many cases have been reported in which the walls have been penetrated and perforated by careless manipulation.



FIG. 34. Atlee's dilator for dilating the pin-hole os.

UTERINE DILATORS. Formerly dilatation of the cervix was secured by the use of tupelo, laminaria, or sponge tents. Dilatation by this means is necessarily slow, while the risk of septic infection is great. At the present time, therefore, operators almost invariably resort to metallic dilators, the operation being done under an anesthetic quickly and with an absolute minimum of risk of infection. A variety of dilators may be found in the market, from the slender dilator of Atlee (Fig. 34), designed especially to

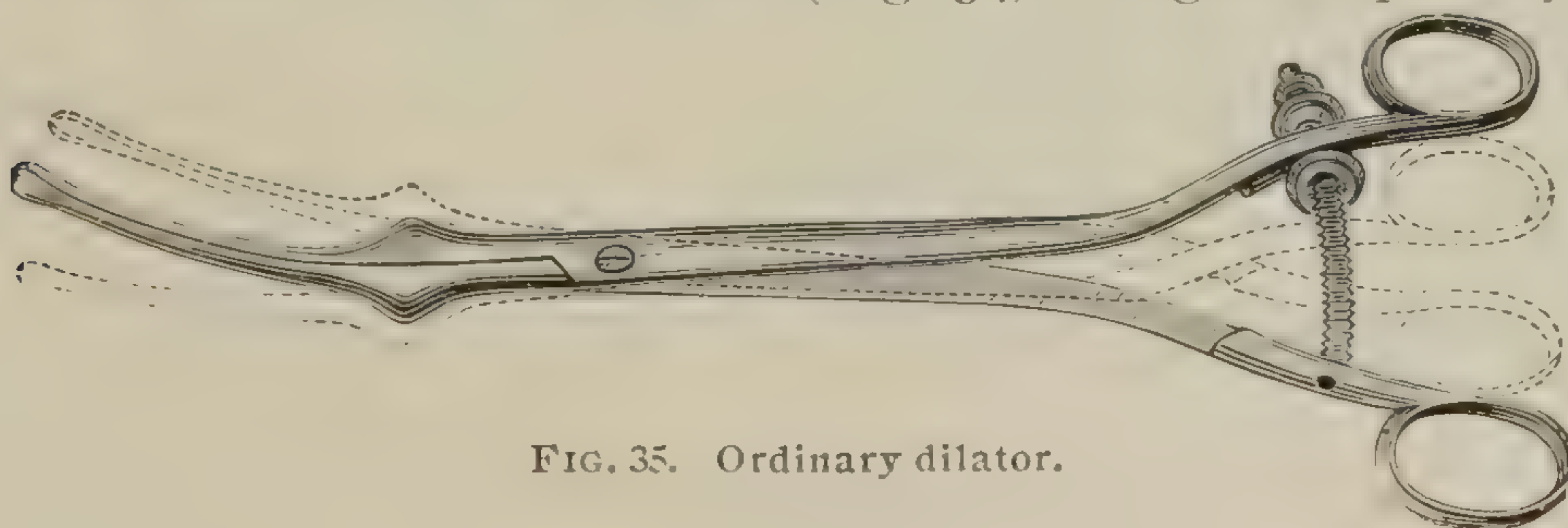


FIG. 35. Ordinary dilator.



enter the pin-hole or occasionally found in nulliparæ, to the powerful instrument which is used for dilating for the removal of

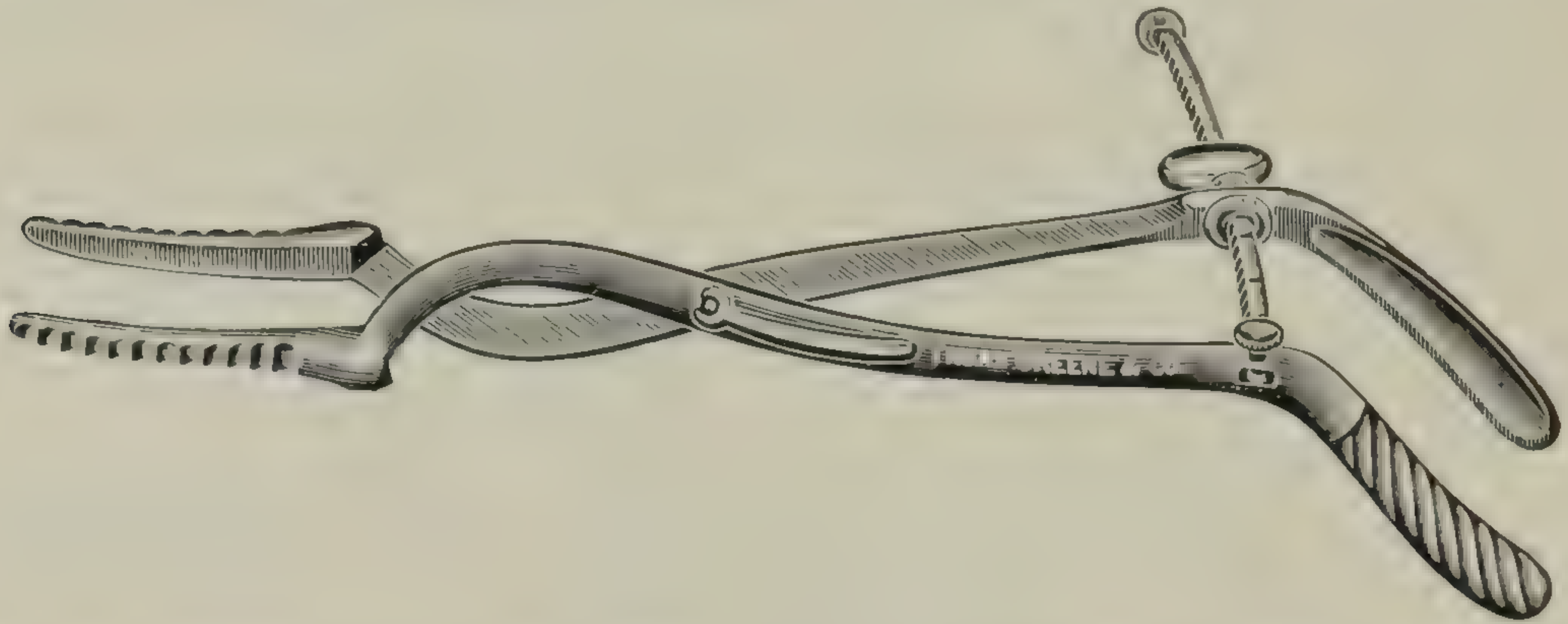


FIG. 36. Powerful dilator, used chiefly to so dilate the cervix as to permit the removal of uterine polyps.

intra-uterine growths (Fig. 36). Another variety of dilators is

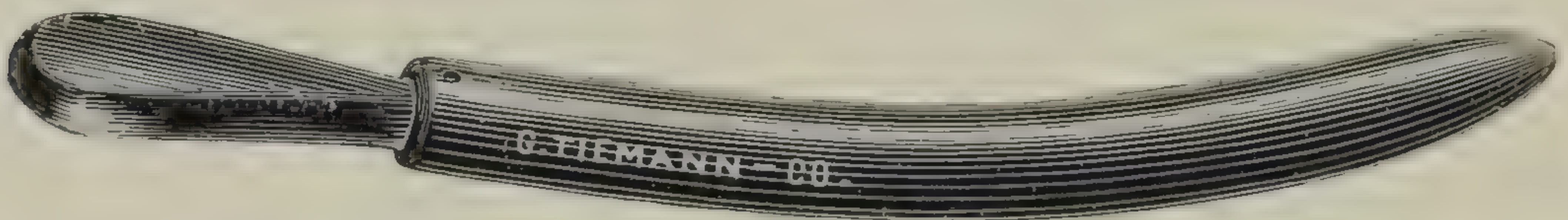


FIG. 37. Hegar's bougies for dilating the cervix. These instruments come in sets of different sizes.

that represented by Hegar's bougies (Fig. 37), or some modification of the same. These bougies may be of glass, hard rubber, or steel. Personally, I prefer those made by Downs Bros., of London.

**ANESTHESIA.** It should be borne in mind that in most cases a really thorough examination can only be made when the patient is fully anesthetized. To be sure, a good working diagnosis can ordinarily be arrived at without going to this extreme, but if a thoroughly satisfactory diagnosis is essential an anesthetic should almost always be given.

**SIMON'S METHOD.** I have not mentioned above what is known as Simon's method of exploration, which consists in the introduction of the entire hand, or hand and arm, into the lower bowel. This procedure requires the possession of an unusually small hand and the greatest possible care in manipulation. Even with favorable conditions present its use has in a number of instances been followed by fatal results from rupture of the bowel.



So little is gained by this method that it is probably at the present time never resorted to by any operator.

PERCUSSION AND AUSCULTATION are adjuncts to diagnosis which should not be overlooked in the work of the gynecologist. The same general principles that apply elsewhere apply here. The presence of gas or fluid will be quickly determined by percussion. Auscultation is of value chiefly in the differential diagnosis of other abdominal tumors from pregnancy. The hearing of the fetal heart will, of course, settle the diagnosis. The peculiar sound of the placental bruit may, however, be simulated by the blood coursing through vascular growths, or even by the pressure of a hard tumor upon an arterial trunk. Its presence, however, should lead to a most thorough re-examination before pregnancy can be positively excluded.

Too much stress cannot be laid upon the importance of making every examination as complete and thorough as is possible. Gross errors in diagnosis are almost invariably the result of carelessness rather than of ignorance.



## CHAPTER VIII.

### DISEASES OF THE EXTERNAL GENITAL ORGANS.

**V**ULVITIS. 1. One of the most common forms of inflammation of the vulva is that which is simply catarrhal in type, either acute or chronic. It is found most frequently in young children as the result of uncleanness and neglect. The inflammation sometimes passes up into the urethra and vagina. The treatment consists in cleanliness, with the use of mild astringent washes or powders. As pin worms sometimes produce this disturbance by migration from the rectum, it would be well to examine the latter cavity in cases which do not yield readily to mild treatment. In the chronic form it is usually necessary in addition to local remedies to institute some constitutional treatment by giving attention to the hygiene of the patient and the internal administration of alteratives and tonics, among the latter the syrup of the iodide of iron being most frequently indicated.

2. GONORRHEAL VULVITIS is sometimes so severe as to mask the existence of the disease elsewhere. The very violence of the inflammation would lead to a suspicion of the diagnosis, which more careful investigation and examination will usually confirm. The treatment is simply that which would be given to the disease itself.

3. PHLEGMONOUS VULVITIS. This is usually the result of local injury and is usually limited to one side of the vulva. On examination a swelling will be found, the character of which may usually be diagnosticated without much difficulty. It must, however, be differentiated from a labial hernia, either of intestine or ovary, and from hydrocele of the round ligament. The history of the case and palpation will usually establish the diagnosis.

4. DIPHTHERITIC VULVITIS is occasionally found, usually in connection with diphtheria of the throat. The diagnosis would



be made by finding the disease in other parts of the body, or in other members of the family. Its treatment here would not differ materially from its treatment when occurring in the usual site.

5. **GANGRENE.** One of the rare diseases of the vulva is that known as noma, or gangrene. It is found in poorly nourished children usually, although it sometimes follows long continued pressure during labor and in the mal-nutrition subsequent to infectious fevers. When occurring in children it is almost invariably fatal. In its treatment it is necessary to incise freely, so as to give good drainage, and then to apply antiseptic solutions. Internal treatment, by tonics and nourishing diet, is of prime importance.

6. **DIABETIC VULVITIS** is usually accompanied by a great deal of itching, and much of the inflammation is probably the result of the scratching, from which the patient cannot refrain. The character of the disease should be suspected from the history of the patient, but a chemical examination of the urine and the detection of sugar therein would be conclusive. The treatment is purely constitutional, directed to the disease itself, although locally the ordinary treatment of pruritus should be adopted.

**PRURITUS VULVÆ** is usually a symptom merely of some local or constitutional disease. Its presence should lead to a careful examination to determine the condition of the parts locally, and the condition found will indicate the line of treatment. In some cases it seems to be a pure neurosis, and the treatment then, in addition to constitutional remedies, consists in the local application of sedatives, such as lead water and laudanum, carbolic acid washes, menthol in ether or oil, and occasionally even the application of nitrate of silver.

Syphilis and various skin diseases, notably eczema and herpes, and also lupus, elephantiasis and kraurosis, are to be met with in the vulva, but these, together with the new growths, such as epithelioma, angioma, myxoma, lipoma and mucous and sebaceous cysts, possess no special gynecological interest. All are described in the works on general medicine.



VULVO-VAGINAL GLAND. Abscess of this gland is not an infrequent occurrence, being the result either of a local injury or of gonorrheal extension. The swelling comes to involve the entire labium and is exceedingly painful. Notwithstanding the swelling of the lip, the globular character of the tumor can usually be made out. Hot fomentations should be applied, but if pus forms the abscess should be freely opened on its inner side, the sack dissected out, if possible, or if not then packed with gauze, the packing being renewed until healing takes place from the bottom.

Occlusion of the duct of this gland occasionally takes place, resulting in the formation of a retention cyst. The diagnosis is usually easy. Treatment consists either in dissecting out the sack or in removing an elliptical portion of its surface and stitching the lining to the vaginal membrane, so as to secure obliteration of the cyst.

PUDENDAL HERNIA. The hernia passes down along the round ligament through the unobliterated canal of Nuck, and corresponds to a scrotal hernia in the male. It not infrequently contains an ovary alone or with a loop of intestine or piece of omentum. It is produced by the same class of causes as are other hernias. Its diagnosis is easily established, as it differs markedly from affections of the vulvo-vaginal gland, with which it is most apt to be confused. The tumor is elongated, extending up to the inguinal ring, is comparatively insensitive, has an impulse on coughing, is somewhat tympanitic on percussion if it contains bowel, and can usually be reduced. Its treatment is the same as that of inguinal hernia in the male. (A very rare form of pudental hernia is that in which the protruding viscus passes through the pelvic fascia in front of the broad ligament and along the side of the vagina to the labium.)

HYDROCELE of the round ligament is a rare affection. Its symptoms are similar to those of hydrocele of the cord in the male, and its treatment the same.

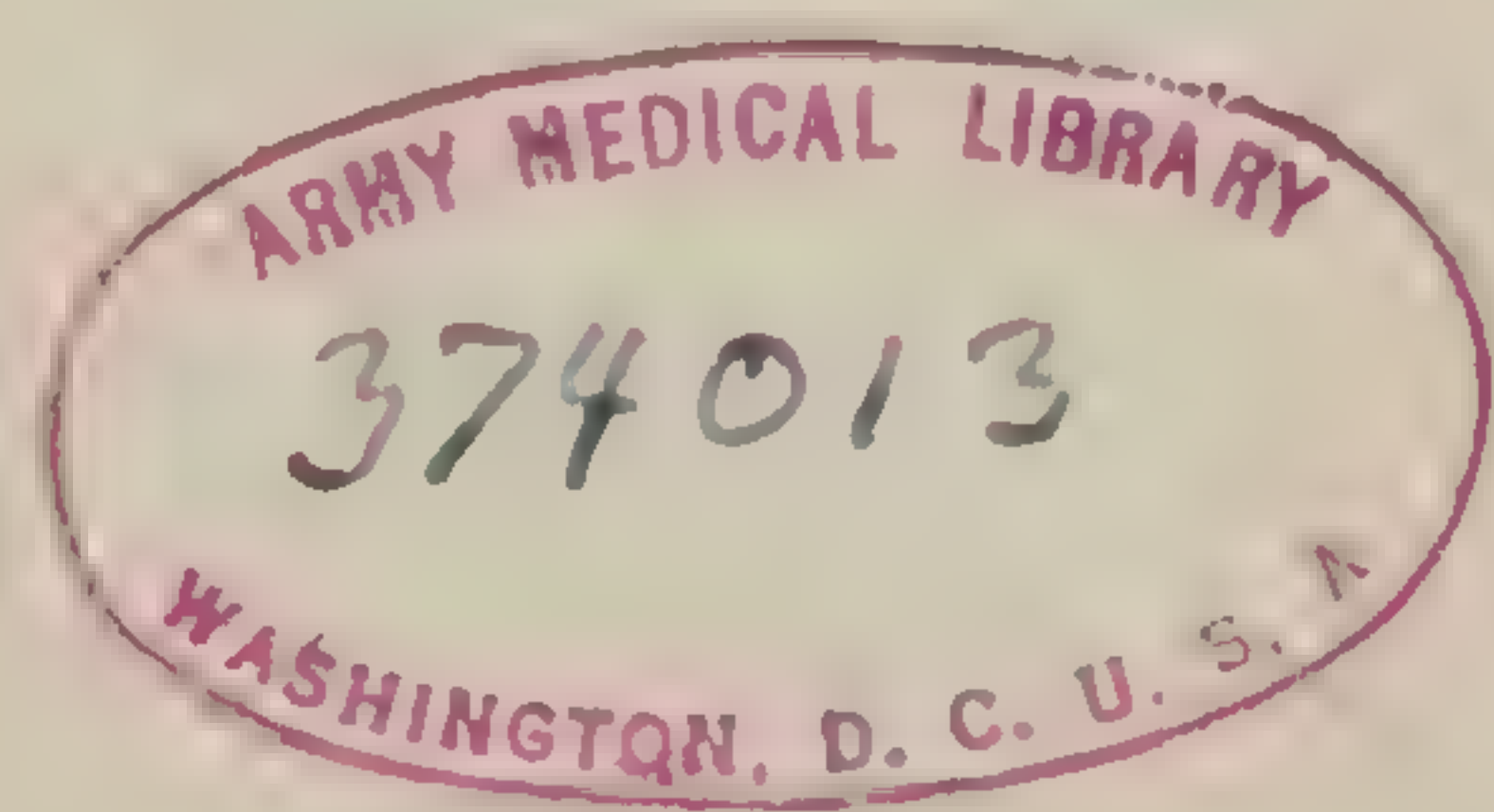


VARICOSE TUMORS occasionally appear upon the vulva as the result usually of pregnancy, although they sometimes result from the pressure of pelvic or abdominal tumors. This varicose condition may prove so serious as to require interference with the continuance of the pregnancy, though usually rest in bed with a compress and bandage will give such relief that the patient will go to full term.

PUDENDAL HEMATOMA. This is an effusion of blood in the areolar tissue of the labium and surrounding parts. It is caused by a ruptured vein, the rupture being the result usually of a local injury or of strong bearing down efforts during the second stage of labor. Its chief symptoms are great pain with sudden swelling of the region involved. The swelling is at first soft, but becomes more firm as the blood clots. There is a lack of impulse in coughing, it is non-resonant on percussion, and is irreducible; these facts serve to differentiate it from hernia. In its treatment it is customary to attempt to check the effusion at first by cold applications and pressure. Sooner or later, however, and immediately if the effusion is due to labor, it is necessary to open the part with a free incision, turn out the clots, and seize with hemostatic forceps the blood vessel if it can be found, or if necessary pack the cavity with iodoform gauze. Under aseptic treatment healing takes place rapidly.

HEMORRHAGE FROM THE VULVA is usually the result of blows or falls. It is most frequently caused probably by women falling astride the back of a chair, the injury being produced by the crushing of the tissues between the chair back and the pubic bone. Owing to the great vascularity of the parts, the hemorrhage is sometimes exceedingly alarming. It can be immediately controlled by pressure with the fingers, but as soon as possible the blood vessels should be caught with hemostatic forceps, and ligated if necessary.

Hemorrhage from laceration of the hymen is sometimes profuse and requires treatment on general principles.





PAPILLOMATA, or warts, are not uncommon on the external genitalia, the result usually of gonorrhea or syphilis though sometimes produced by uncleanly habits. They should be treated by excision with curved scissors.

MALIGNANT TUMORS of the clitoris and vulva are fortunately rare. Their diagnosis is to be made on general principles, and their treatment does not differ from the treatment of similar diseases in other parts of the body.

URETHRAL CARUNCLE. This is an exceedingly sensitive tumor, in size and shape most frequently resembling a small red raspberry, found protruding at the mouth of the urethra and usually involving only a portion of the circumference of the meatus. It usually causes pain in urination and prohibitive dyspareunia. Its diagnosis from urethral polyp or prolapse is not difficult, as its color and peculiar sensitiveness serve to distinguish it. Treatment consists in thorough removal, usually by transfixing the base and ligating. If the growth is too sessile for the use of the ligature, the Paquelin cautery should be employed to effect thorough removal.

URETHRAL PROLAPSE. This is a prolapse of the mucous membrane lining the urethra, and is usually found in children. It should be treated by careful replacement and rest in bed. If this does not suffice, the excess of mucous membrane should be drawn forward and removed by scissors, and the urethral and vaginal mucous membranes stitched together by fine silk or catgut. In some cases it is better to resort to the button-hole operation of Emmet, which consists in opening the septum between the vagina and urethra by an incision about half an inch long, commencing about a half inch back of the meatus. Through this incision the excess of mucous membrane is drawn and excised, and the resulting urethro-vaginal fistula closed at once or subsequently.

VAGINISMUS is the name given to a peculiarly painful and spasmodic contraction of the vaginal sphincter. It is usually produced by reflex irritation from a sensitive point or points connected with the remains of the torn hymen. Frequently a minute



ulceration will be found at the base of a fissure in the hymen, and the pain is analogous to that which is found in anal fissure. Treatment consists in excision, if necessary, of the entire remains of the hymen. Healing usually takes place kindly and there is no further trouble. Where no such local cause can be found, the parts should be thoroughly dilated under an anesthetic and a large-sized glass or rubber plug inserted, which should be allowed to remain for some time. It occasionally happens that the point of reflex irritation is at a distance from the vagina itself, as in the anus or urethra.

COC CYGODYNIA is due to some morbid condition involving the coccyx, or the muscles attached to it. It is most common in multiparæ and is usually produced by injuries during parturition, or by direct injury to the coccyx. It sometimes has its origin, however, in disease of more distant organs, as the uterus or ovaries. It sometimes seems to be purely a neurasthenic manifestation. When due to a disease in the bone itself or its muscles, removal of the coccyx is usually indicated. As the bone is superficial the operation is a simple one, care being necessary only to keep the point of the knife in as close contact with the bone as possible.



## CHAPTER IX.

### DISEASES OF THE VAGINA.

**V**AGINITIS. This usually presents itself in either the acute or chronic form. The acute is ordinarily the result of gonorrhea, but may be produced by other sources of infection, uncleanness being an important factor. Among the exanthemata measles and scarlet fever are especially prone to show some involvement of this among other mucous membranes. If the simple inflammation becomes chronic, the papillæ may be infiltrated with cells, and as they thus become enlarged constitute a condition known as granular vaginitis.

Among the atrophic changes of old age there sometimes occurs a loss of vaginal epithelium, resulting in denuded patches varying in size. Nearly the entire surface may be thus involved, and as adjacent denuded patches come together adhesions may take place, which has led some writers to refer to this form of vaginitis as adhesive.

**TREATMENT.** Unless due to gonorrhea, cleanliness and mild applications usually result in a prompt disappearance of the disease; except the senile form, which requires more care and is not infrequently incurable, although the discomfort may be relieved by the use of protecting ointments especially those containing boracic or carbolic acid.

The gonorrheal form requires active treatment which should be continued until the microscope shows the entire disappearance of the infection. During the active stage the patient should be kept in bed and the bowels kept freely opened with salines. Every three to six hours a hot vaginal douche should be given of at least a gallon of water containing one drachm of boracic acid to the pint. This should be followed by a douche of bichloride solution (1-5,000) with which the vagina should be distended by pressing the vulva around the nozzle of the syringe. After the



active inflammation subsides the vagina should be thoroughly exposed by placing the patient in the knee-chest or Sims position, and after then cleansing the surface it should be painted over with a rather strong solution of the mercurial (1-1,000), these applications being preceded, if the patient complains of much pain, by a four per cent. solution of cocaine. If the disease still proves rebellious, the surface should be painted with a solution of nitrate of silver containing three to five grains of the silver to the ounce. After the application of the stronger remedies the vagina should be packed with wool or gauze, so as to keep the surfaces from contact with each other.

The urethritis, which is the common accompaniment of the vaginitis, should be treated at the same time by the usual methods.

CYSTS OF THE VAGINA are usually small, seldom exceeding in size a horse chestnut, although cases have been reported where they were as large as a fetal head. They are generally simply retention cysts, but occasionally undoubtedly originate from the remains of the Wolffian canal. The contents usually consist of a viscid transparent fluid.

TREATMENT consists in removal of the cyst, either by extirpation, if it is reasonably accessible, or by excision of a considerable portion of its surface and packing the cavity with gauze, so as to compel healing from the bottom.

FIBROID TUMORS are rarely found in the vagina. They usually occur in connection with the anterior wall and should be treated by removal.

FOREIGN BODIES are occasionally found in the vagina, having found their way there either by accident, curiosity, or violence. No special directions can be given for their removal except that care should be exercised, especially if the foreign body is large or brittle, or has been long retained. Pessaries have sometimes been introduced and forgotten, and after remaining for many years have produced, by their irritation, such profuse discharge as to lead to a diagnosis of cancer. Indeed, as a result of their irritation cancer has been known to develop.



**THE MENOPAUSE.** Although the changes which usually follow the menopause cannot be regarded as pathologic, it is well to bear them in mind lest an error in diagnosis should be made. At the menopause, then, the vaginal folds become obliterated so that the surface is quite smooth, especially its upper portion. The entire vagina contracts so that it assumes a more or less conical form with the os uteri at the apex. The drawing down of the vagina causes the vaginal cervix to entirely disappear so that its position is indicated merely by a little depression, frequently found only with difficulty by the examining finger.

In multiparæ there is frequently more or less prolapse of the vagina. This is sometimes so marked as to constitute a hernia of the entire pelvic floor. Usually, however, this affection is shown by the presence of either a cystocele or rectocele, or more frequently both.

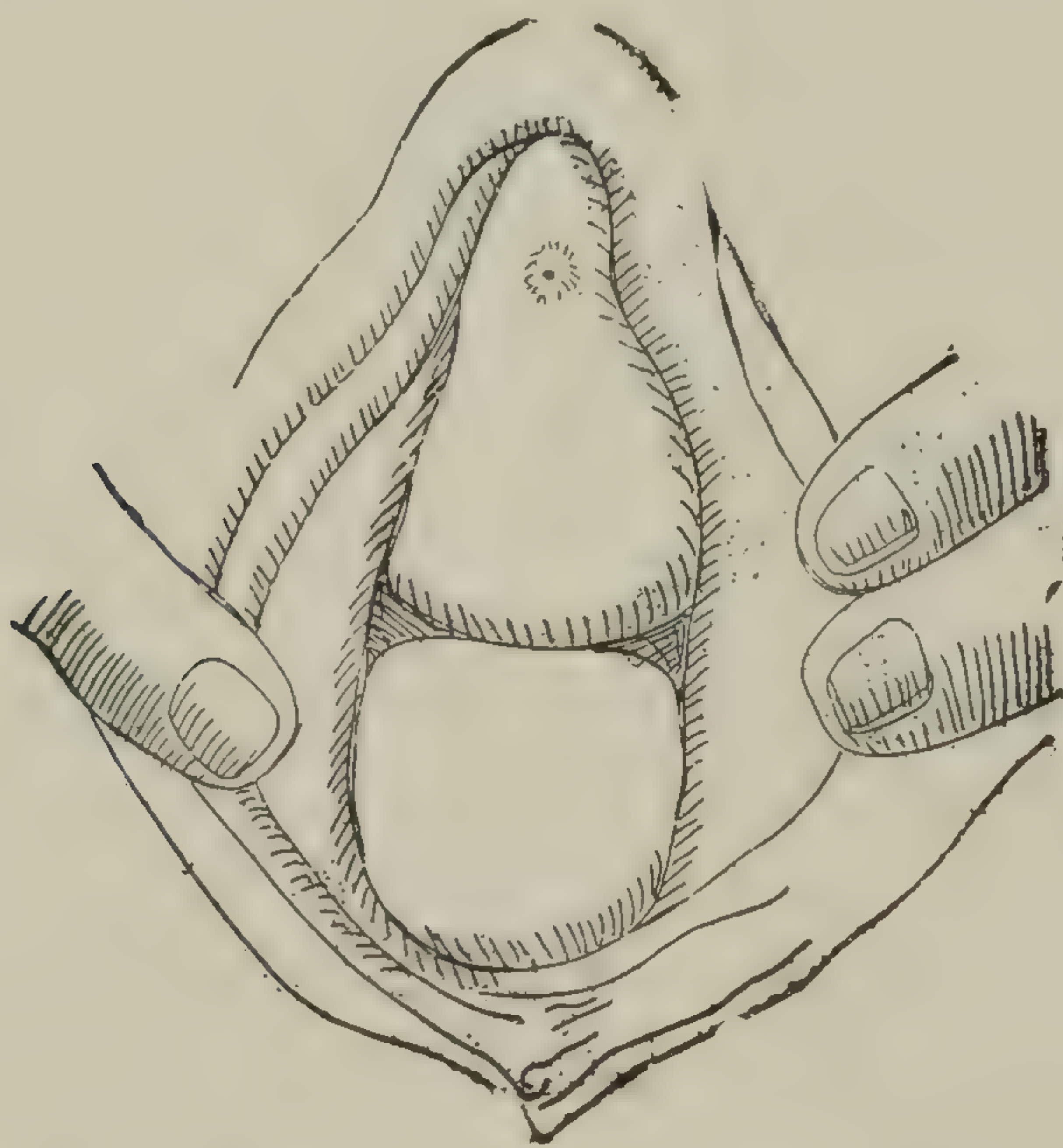


FIG. 38. Combined cystocele and rectocele, as seen protruding at the vulva.

**CYSTOCELE** (Fig. 38) is a prolapse of the anterior vaginal wall, including the base of the bladder. This hernia disappears when the woman is lying down, but on standing on her feet, or when bearing down, the swelling re-appears, with its smooth rounded outline bulging through the vulva. If the lower part of



the wall is chiefly affected the swelling may be most marked at the upper portion of the urethra, then constituting what is called an *urethrocele*. The examining finger easily passes behind this swelling and reaches the cervix. A sound or catheter introduced



FIG. 39. The same in sectional view.

into the bladder can be made to enter the cystocele and the tip can be felt outside of the vulva: thus making the diagnosis certain.

RECTOCELE is a similar hernia of the posterior vaginal wall, carrying with it the anterior wall of the rectum. The swelling in this case resembles very closely that of cystocele. Indeed, from mere inspection it is frequently impossible to state whether the projecting tumor is a cystocele or rectocele, but the introduction of the finger into the vagina immediately establishes the diagnosis. If the finger is introduced into the rectum it can be carried forward into this pouch, at once clearing up the diagnosis. Rectocele is nearly always an accompaniment of a lacerated perineum.

When cystocele and rectocele co-exist, we find present at the vulvar aperture two tumors, between which the examining finger can be passed to the cervix.

CAUSES. These conditions seem to be the direct result of parturition, especially when the act is speedily or many times



repeated. A single confinement, however, especially if the disproportion between the fetal head and the passages is marked, may result in very aggravated forms of vaginal prolapse. Uterine procidentia even, as it is occasionally found in multiparæ, may also cause this condition by dragging down the vaginal walls. A lacerated perineum, by removing the natural support to the posterior vaginal wall, usually brings about a bulging of this part. The straining, incident to attempts at stool, and the distension of the rectum by fecal masses, increase this protrusion. As the rectocele becomes larger the causes producing it act to better advantage, so that the formation once started tends to progress until the condition is fully developed. In aggravated cases this pouch becoming filled with hardened feces can only be emptied by the finger introduced into the rectum, aided by manipulation from the vagina.

Cystocele results from the pushing down of the vagina by the advancing head. Following the delivery the elasticity of the vagina should bring it back to its normal position, but with repeated labors, the vaginal wall remains permanently loosened and is caused to project by the weight of the bladder and its contents and the pelvic viscera. In cases in which the child's head is unduly large, the cystocele may be formed by a single birth as a result of the giving way of the firm connective tissue which binds the bladder and vagina together and which normally tends to support the base of the bladder. Cystocele is usually found as an accompaniment of laceration of the perineum and its repair should be considered only in connection with the repair of the perineum, which usually gives such support to the anterior vaginal wall as to enable the tissues to recover their natural tone and thus cause the tumor to disappear.

DIAGNOSIS. The patient usually comes with a complaint of a sensation of weight and bearing down when on her feet and that there seems to be something which protrudes from the vulva. She will probably say that she has "falling of the womb." If the rectocele is at all marked, she will complain of difficulty in secur-



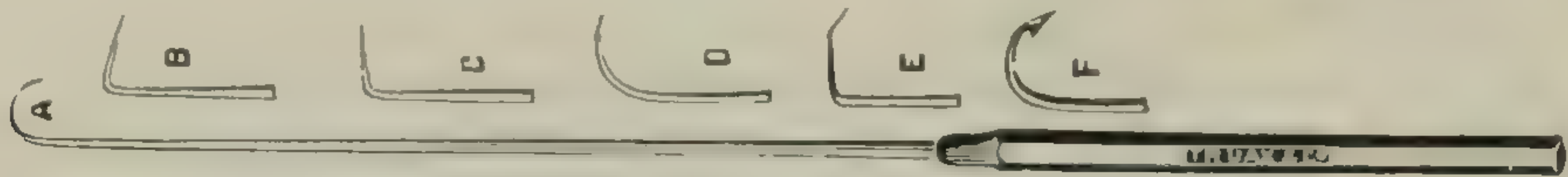
ing a movement from the bowels; will very likely state that she has to assist by the use of her fingers. If the cystocele is marked she will complain of a frequent desire to urinate and of not being able to satisfactorily empty the bladder. She will perhaps state that she occasionally has to get on her hands and knees in order to empty it completely. On making a vaginal examination, especially if the woman is in the upright position, the protruding swelling or swellings will be at once discovered. If the case is of recent standing the mucous membrane will retain its ordinary characteristics, but if of long standing this membrane may be almost parchment-like. The uterus may be found occupying its normal position, or it may be more or less prolapsed. The diagnosis is absolutely confirmed by passing the finger through the anus into the rectocele and a sound through the urethra into the cystocele.

TREATMENT. This, if simply palliative, consists in rest in the recumbent position, the use of astringent douches, or the placing of a suitable pessary. None of these means afford much relief and are generally found entirely unsatisfactory. Curative treatment consists in some form of operative procedure by which the perineum, if ruptured, is restored and the vagina narrowed anteriorly and posteriorly as may be needed. If there is marked uterine prolapse and the uterus is at all hypertrophied, it will probably be necessary to perform some operation for the suspension of the uterus in addition to the procedures already mentioned. This support will probably take the form either of a ventral suspension or of shortening the round ligaments. If this procedure is omitted the continued weight of the uterus will probably cause a yielding of the cicatricial tissue at the points of vaginal operation, and finally a reproduction of the original trouble.

OPERATIONS FOR CYSTOCELE. If a good deal of the anterior vaginal wall is involved in the tumor, *Emmet's operation* (Fig. 40) is probably the best. With a snip of a sharp pointed scissors, or with a tenaculum, a point is marked just posterior to the urethra and another just in front of the cervix. With two tenacula the lateral walls of the vagina are caught and approximated. If too



much tissue is between the tenacula, so that the vaginal walls are placed on the stretch when the tenacula are brought together, they should be re-inserted nearer to each other until the proper



Different styles of delicate tenacula for vaginal work.

degree of tension is secured. The four points which are thus marked are now connected by numerous snips of the scissors so that an oval piece of the mucous membrane is marked out. These snips enter but do not go through the vaginal mucous membrane. At the most anterior point the mucous membrane is now opened

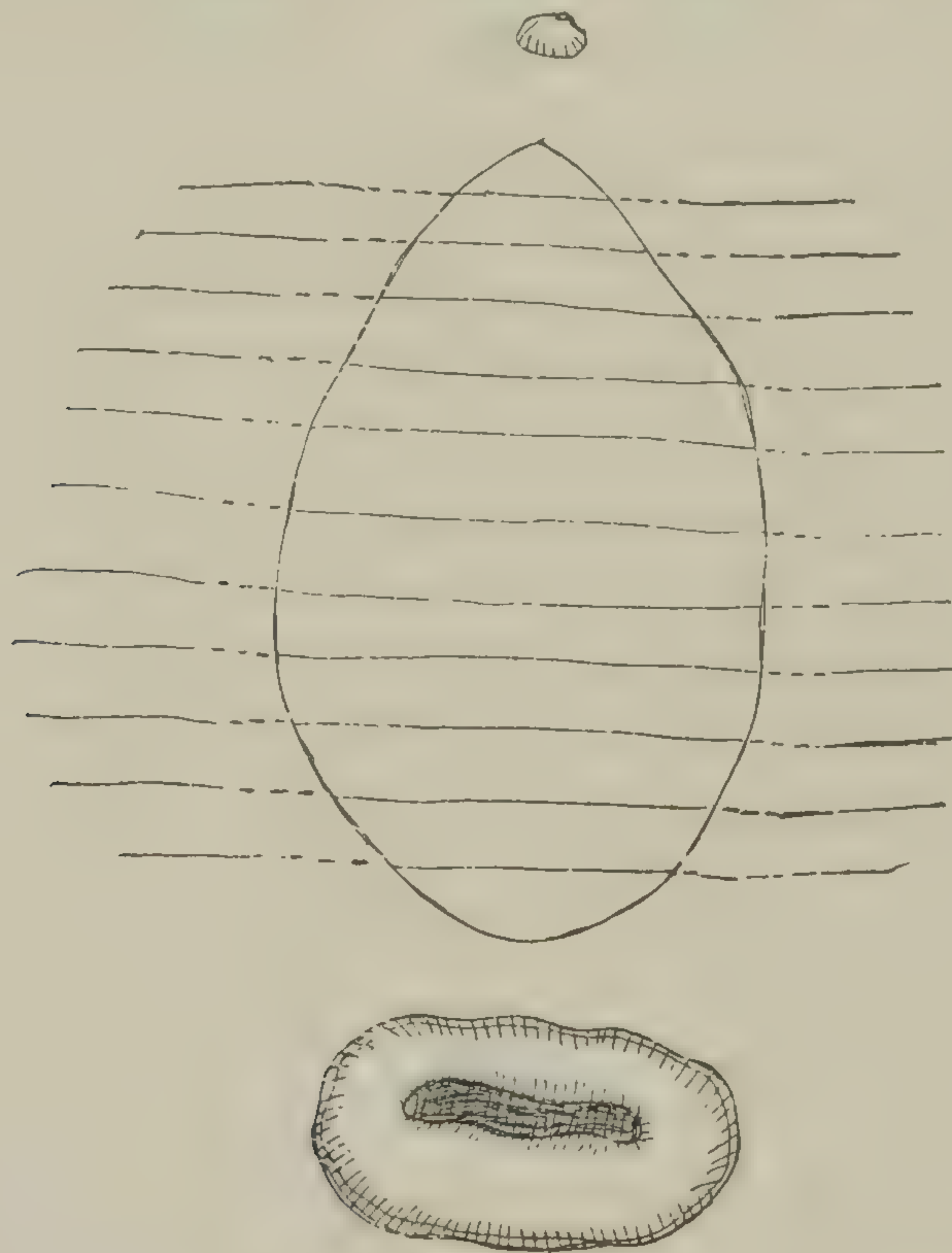


FIG. 40. Emmet's operation for cystocele. The sutures are represented as all inserted and none tied.

carefully, so as not to wound the bladder, until the connective tissue between the vaginal mucous membrane and that of the bladder is reached. The finger is now carefully introduced and the two membranes separated until the oval previously marked out is entirely detached from the bladder. After being thus de-



tached it is easily removed by blunt scissors curved on the flat. By using the finger instead of scissors to separate the mucous membranes the risk of injuring the bladder will be very much reduced. It is well to separate the mucous membrane a little beyond the line previously marked out, as the subsequent insertion of stitches will be thus much simplified. With the curved needle and needle forceps, or better still with a handled needle with a hook near the point, catgut or kangaroo tendon sutures are introduced from side to side so as to carefully approximate the edges of the wound. It is better to introduce the deeper stitches first. The stitches should be tied as introduced, as this is much simpler than to introduce them all first and then separate them into pairs for tying. If, however, there is much tendency to oozing of blood, it is better to leave the tying until the last as the exposure of the surface usually stops the hemorrhage.

If the cystocele, as is frequently the case, constitutes a prac-

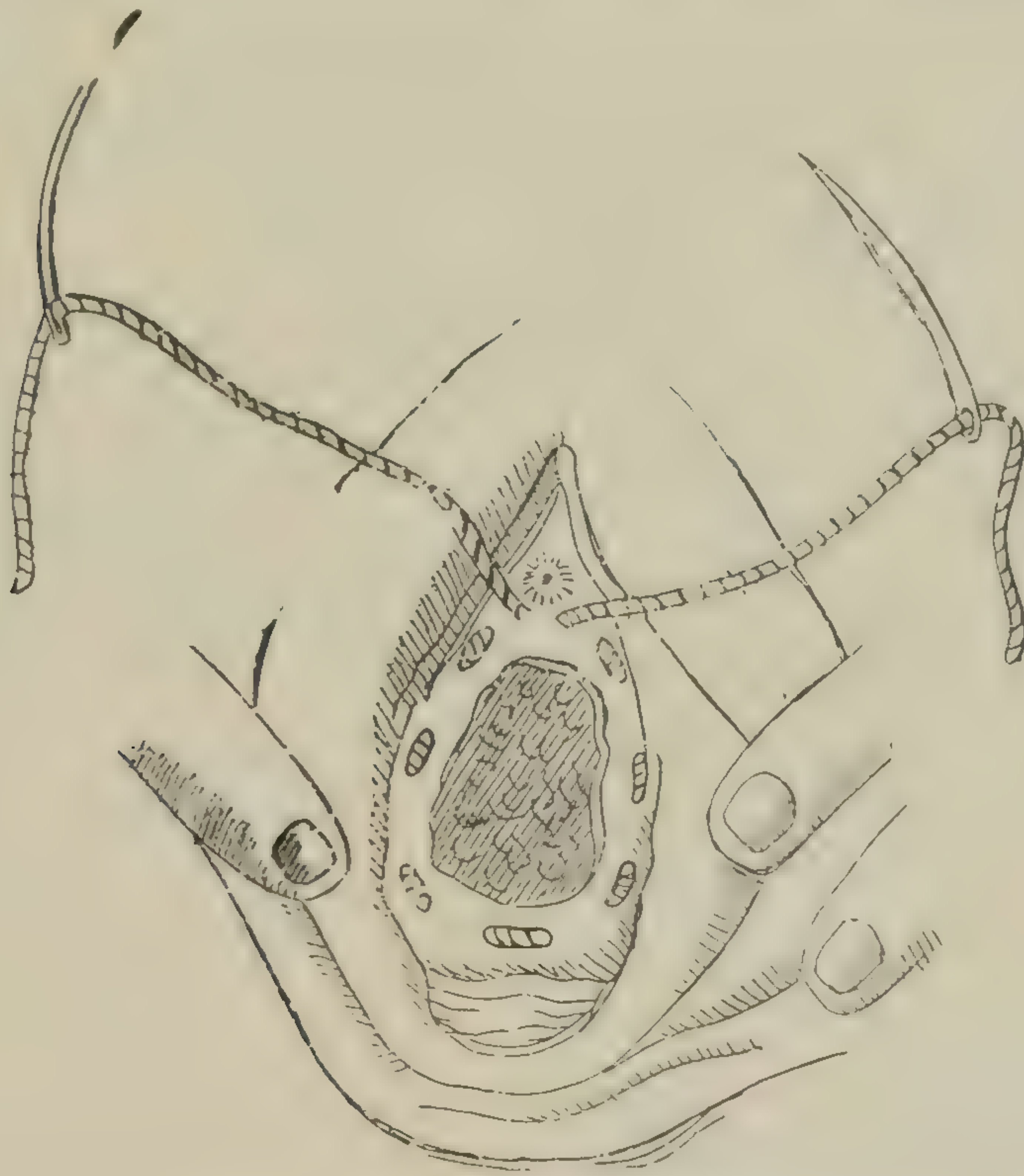


FIG. 41. Stolt's operation for cystocele. The purse string suture inserted ready to be tightened and tied.

tically round tumor, *Stolt's operation* (Fig. 41) will be found more satisfactory. This consists in removing a circular piece of vagi-



nal mucous membrane from the most prominent point of the cystocele. The amount to be removed is to be determined by careful approximation of the sides, as in Emmet's operation. The separation and removal are effected as in that operation. The suture, however, is of the "purse-string" variety, and the manner of its introduction is best explained by the accompanying cut. After being inserted the ends of the suture are drawn snugly together so that the anterior wall of the vagina is puckered into folds in the center. Kangaroo tendon is excellent material for this suture, as its subsequent removal is unnecessary.

OPERATION FOR RECTOCELE AND RUPTURED PERINEUM. As rectocele is almost invariably accompanied by laceration of the perineum, and both conditions are relieved by one operation, the reader is referred to the chapter on ruptured perineum for further information. In the rare cases where there is no laceration of the perineum, the treatment of the rectocele is practically the same as that of cystocele by Emmet's operation. As the vaginal and rectal mucous membranes, owing to the over-stretching, are sometimes very thin, care must be exercised lest in separating the two the rectum be opened.

After completing the operations for cystocele and rectocele, whether singly or combined, the vagina should be carefully cleansed and lightly packed with iodoform gauze. The bladder should not be allowed to become at all distended, but should be emptied systematically by the catheter. The bowels should also be kept fairly loose by the administration of laxatives, so that there may be no impaction of the rectum. The presence of the gauze serves to support both lines of stitches, but it is wise to aid its action by keeping both bladder and rectum from becoming distended.

ENTERO-VAGINAL HERNIA is rarely found except in connection with prolapse of the pelvic viscera. Sometimes, however, as the result probably of unusual depth of Douglas's pouch there is a yielding at this point and the condition of hernia is produced. It can be differentiated from rectocele by the simultaneous intro-



duction of the index fingers into the rectum and vagina, when the prolapsed intestine can be easily felt between them.

TREATMENT consists in removing redundant tissue and restoring the perineum, if rupture of this organ has been the cause of the condition. In one very marked case which I saw a number of years ago the pouch extended to the vulva but, owing to the

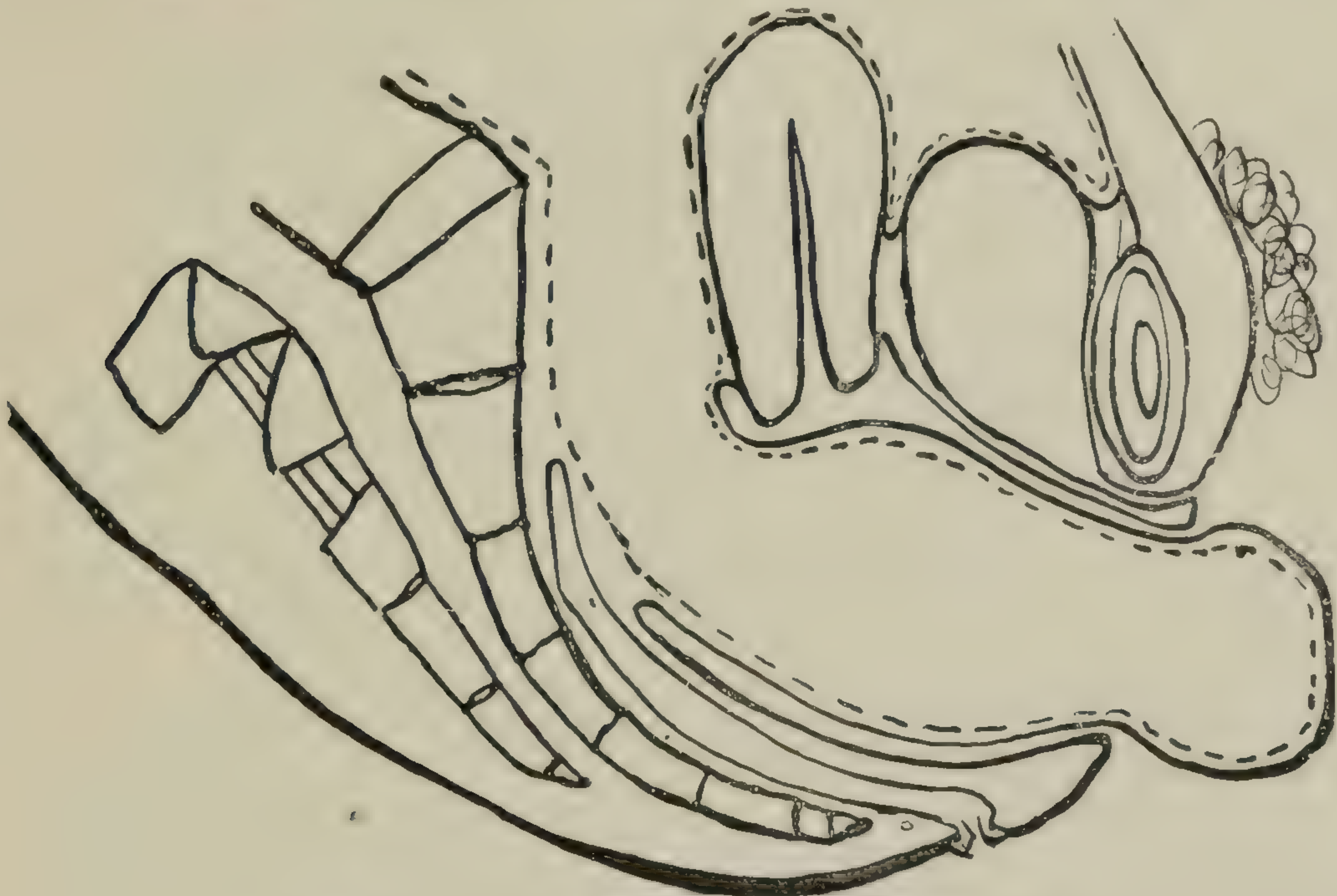


FIG. 42. Diagram illustrating author's case of entero-vaginal hernia.

retroversion of the uterus and an unusual bedding of fat, had quite a narrow neck. I incised the sack, and after painting its interior with a 1-1,000 solution of bichloride, introduced vaginal packing. The result, as anticipated, was adhesive inflammation and permanent obliteration of the sack.



## CHAPTER X.

### LACERATION OF THE PERINEUM.

THE PERINEUM consists of the mass of tissue situated between the posterior border of the vulva and the anterior border of the anus and extending up to the point where the vagina and rectum come into immediate apposition. The perineum is composed of muscles, connective and elastic tissue, fat, nerves and blood vessels. The important muscles are the transverse perinei and levator ani. This body is liable to be more or less torn in child-birth, but may be injured by accidents, as by the entrance of foreign bodies.

RUPTURED PERINEUM. By this term is meant a tear involving the lower portion of the posterior vaginal wall and the perineum. It is *partial* when the laceration does not extend deeper than the sphincter ani. It is *complete* when the sphincter ani is involved throughout its entire thickness and the tear extends for a greater or less distance up the anterior wall of the rectum. It is *central* when the tear occurs between the fourchette and the anus, but does not involve the former. This variety of laceration is exceedingly rare and occurs usually as the result of loss of vitality of the thinned-out perineum, owing to the long-continued pressure of the impacted fetal head. Under these circumstances the child is usually born through the vulva, but cases have been reported in which the child has been delivered through this central opening. (I saw one such case some years ago, in which the child was born before the arrival of the attending physician.) It occasionally happens that while the vaginal mucous membrane and the skin may escape laceration, there is a more or less complete separation of the deeper and more important structures. Such a laceration would probably escape notice at the time of parturition, but even a cursory examination would show its presence later. Its treatment does not differ from that of the other forms of laceration.



Laceration is usually caused by the relatively large size of the head or of the shoulders. I think the shoulders are more frequently at fault than most writers seem to admit. Too precipitate labor is frequently the cause, as time is not given for the perineum to relax. If the head is born in the occiput-posterior position the perineum will almost certainly be ruptured unless the head is, at least relatively, unusually small. Unquestionably the improper use of the obstetrical forceps has caused this accident many times, but if that instrument is properly used it tends to preserve rather than injure the perineum. Long continued impaction of the fetal head, by influencing unfavorably the nutrition of the perineum, will likely lead to its giving way when the head is finally born. Unquestionably the perineum is sometimes abnormally soft and friable, and under such circumstances will give way in spite of every effort of the accoucheur. Age doubtless has something to do with this condition of the perineum, as rupture is found to take place much more frequently in old primiparæ.

It is more than doubtful if the different methods which have been devised for what is called "supporting the perineum" amount to anything. The hand of the accoucheur spread over the perineum, or the towel or napkin held across it, probably do more harm than good, by rendering still more anemic the already bloodless perineum. Much, however, can probably be accomplished by pressing the perineum back towards the anus, in cases in which it seems to be unduly rigid, during the first stage of labor, or certainly during the earlier part of the second stage. This can be done first with one finger, then with two, and finally with the entire hand introduced into the vagina. By thus exerting pressure, especially during the pains, the presence of the fingers will not be noticed by the patient, and it is sometimes surprising to note how quickly, under such manipulations, the perineum will soften and become relaxed. If labor is threatening to be too precipitate, chloroform should be at once administered, if necessary (as it probably will be) to the surgical degree, so that



all voluntary efforts of the patient cease. Then, with only the force of uterine contractions to contend against, the accoucheur can easily control the advance of the head and allow it finally to slip out at the vulva between the pains, so as to make its exit at a time when there is the most relaxation. If, at the time the head is about to be born, the accoucheur will press back the tense upper margin of the vaginal orifice until it slips over the occiput, he will find that, as the tension of the upper margin is thus relieved and the occiput passes up a little in front of the symphysis, the tension of the lower margin of the vulva is correspondingly lessened and the head will frequently then be born without even a laceration of the fourchette, when otherwise a giving way would inevitably have taken place. A laceration once started is very apt to be continued until the sphincter is reached.

If the laceration be at all extensive it will usually be found dipping down into one or other sulcus of the vagina, instead of passing directly back, as the tissues immediately posterior are more resisting than those a little to one side. Possibly the fact that the fetal head comes down a little obliquely has something to do, also, with the laceration continuing into one or the other sulcus.

The anatomy of the perineum as given in the ordinary textbooks is entirely unsatisfactory. The best study of this subject with which I am acquainted is that of Dickinson, in the *American Jour. of Obstet.* of Sept., 1889. The origin of the levator ani muscle is principally from the horizontal ramus of the pubes,  $1\frac{1}{2}$  inches below its upper border. The origin has a width of something more than an inch, commencing about half an inch from the symphysis, so that the two halves of the muscle do not come together in the middle. The muscles pass nearly horizontally backward, so as to get behind the lower portion of the rectum, the fibers here being continuous with each other. The muscle, therefore, is really a sling muscle holding forward the lower end of the rectum. The fibers pass alongside the vagina, with the lateral walls of which they are intimately connected, sending some fibers



between the vagina and rectum, where they form an intimate connection with the connective tissue in that plane. A large part of the muscle originates from the pelvic fascia covering the obturator internus muscle, on a line connecting the pubic origin with the spine of the ischium, from which spine also a part of the muscle arises. Those fibers which arise from the ischial spine and from the back portion of the fascia are attached to the coccyx and to the tendinous line running forward from the coccyx. The muscle is strongly reinforced by layers of fascia which cover it on both its upper and lower surfaces. The muscle with its fascia thus constitutes a diaphragm to support the pelvic viscera. The opening in this diaphragm is in its anterior half and transmits the lower end of the rectum and vagina.

In lacerations of the perineum, if only the perineal body, so-called, is involved, the integrity of this diaphragm will not be interfered with and the normal support of the pelvic organs will continue to exist. If, however, the laceration extends higher up, so as to involve the fibers of this muscle or its fascia, running alongside the vagina or passing between the vagina and rectum, there will then be such a giving way of this diaphragm as will almost certainly result in a sinking down of the uterus, this sinking down being followed as a natural result by a backward displacement of the fundus and the prolapse of the organ. In cases of complete laceration there must be secured a reunion of the lateral portions of this muscle and fascia, so as to restore the recto-vaginal septum and thus restore this diaphragm on which depends the support of the pelvic viscera. No operation limited to the mucous membrane of the vagina can accomplish this result. The dissection must be carried deeply enough to reach upon each side the muscular and fascial tissues and so bring them into apposition as to restore the septum.

The position, relationship, and function of the levator ani muscle can nowhere be better studied than on the living subject. It should be studied both in nulliparous and multiparous females, and also in all cases which present themselves in which there has



been, as a result of child-birth, any giving way of this pelvic floor. After introducing the fingers into the vagina and directing the patient to draw the parts together, no difficulty will be experienced in satisfactorily determining the above points. In suitable cases a finger should also be introduced into the rectum so as to determine, approximately at least, the relative amount of muscular pull exerted upon these two canals.

TREATMENT. When a perineum is torn during parturition it should unquestionably, under all ordinary circumstances, be repaired at once. Full directions for its repair are given in all standard text-books on midwifery. That the physician does not have with him suitable needles and silver wire or silk-worm gut, and is too far from his office to procure them, is no excuse for the non-performance of the operation. Good, stout, linen thread is to be procured in every household, as well as good-sized needles or a darning needle. These can be easily sterilized, and will, on the whole, answer about as satisfactorily as the most approved appliances of the instrument maker. If the physician desires a curved needle, which he will not likely need owing to the relaxed condition of the parts, by heating the central portion of an ordinary straight sewing needle or darning needle in a lamp or gas flame, the temper will be so drawn that the needle can be easily bent to the required curve. Care is necessary to clean the lacerated surface, and, by placing a tampon temporarily in the vagina, to protect it until the stitches are introduced and tied. The temporary tampon should then be removed, the parts thoroughly cleansed, and, if suitable facilities are at hand, protected by the usual dressings of sterilized gauze and cotton. If, however, these are not at hand or procurable, good union will nevertheless almost invariably take place. The catheter should be used for several days, as urine dribbling over the wound is likely to prevent immediate union. The stitches should usually be removed in about ten days.

If the laceration has extended into the rectum, the rectal mucous membrane should be carefully approximated by very



fine suture material. The perineum itself should then be brought together with stitches introduced so as to embrace a little of the skin-margin, but taking in a large amount of the tissue upon each side as far back as the vaginal mucous membrane. The first stitches introduced should be next the anus, taking special pains to include the sphincter muscle if this has been lacerated. Great care is necessary in tying the stitches to see that no blood is included, as this will almost certainly become infected and prevent satisfactory union. If the patient is too far away, or if no efficient nurse is at hand, catheterization cannot be employed. In this case the patient should be directed to urinate as usual, but her attendant should be instructed immediately thereafter to wash off the line of sutures with sterilized water, in order to get rid of any urine remaining in contact with the wound.

If the laceration is not too extensive it will not usually be necessary to give an anesthetic; but if the reverse is the case an anesthetic should be given in order that the operator may not be hampered by his sympathy for the patient.

OPERATION FOR LACERATED PERINEUM. If the laceration was not operated on at the time of its occurrence, or if, for any

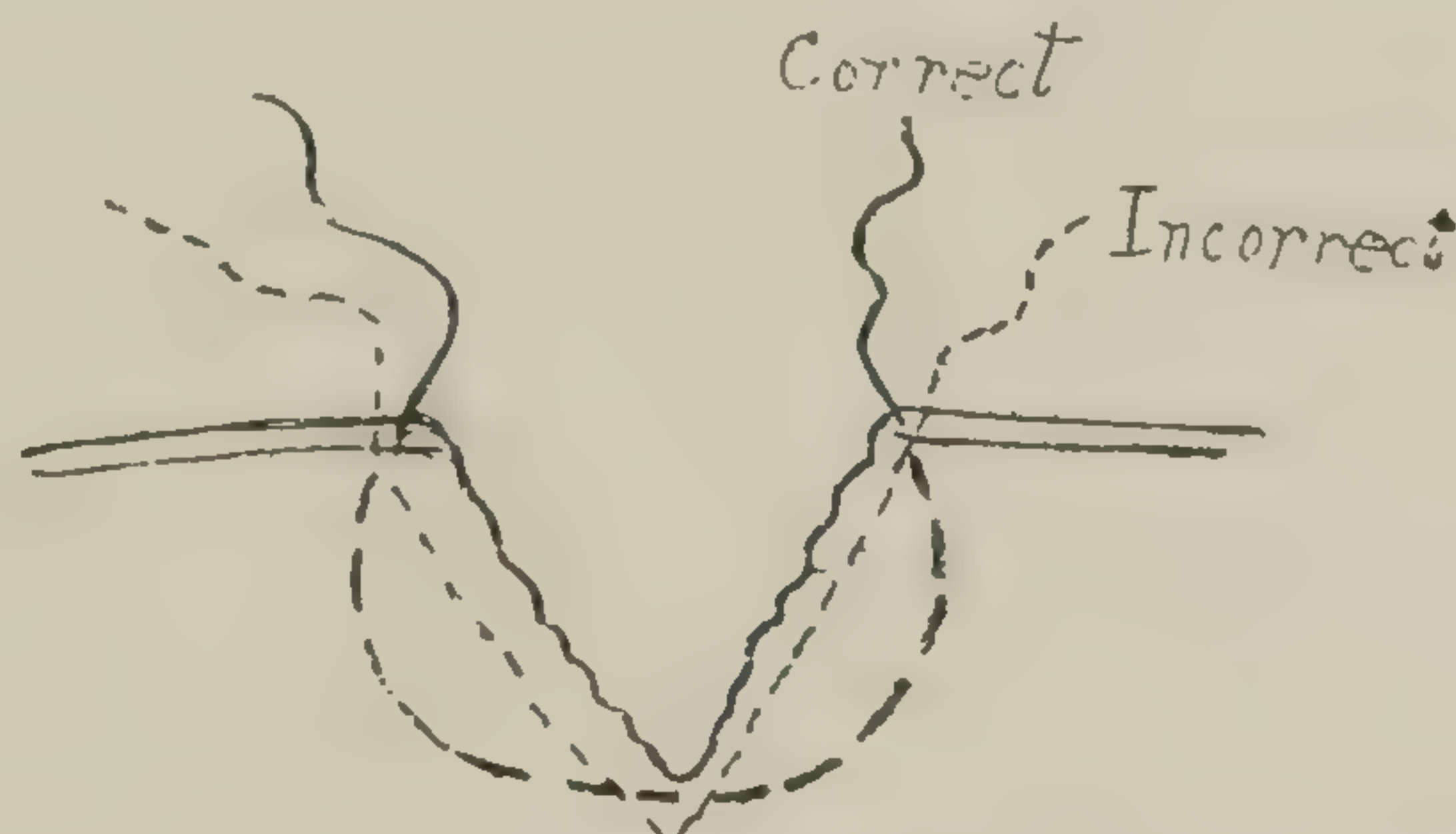


FIG. 43. Diagram showing correct and incorrect methods of introducing perineal sutures in cases in which the laceration is not deep.

reason, there was a failure to secure union, it then becomes necessary to perform a secondary operation for its repair. This operation should not be performed under about three months after the birth of the child. The patient should be prepared for it for several days by having the bowels thoroughly and regularly opened, the diet regulated, and the vagina sterilized by douching



with antiseptics. If there is a laceration of the cervix, this should be closed at the same time as the perineum, the cervical operation preceding the latter. Only a few instruments are needed for this operation: two pairs of sharp pointed scissors, one of them curved on the flat, a half dozen hemostatic forceps, silk-worm gut, silver wire, perforated shot, perineum needle, ordinary curved needles with needle forceps and shot compressor. A little catgut will also probably be needed.

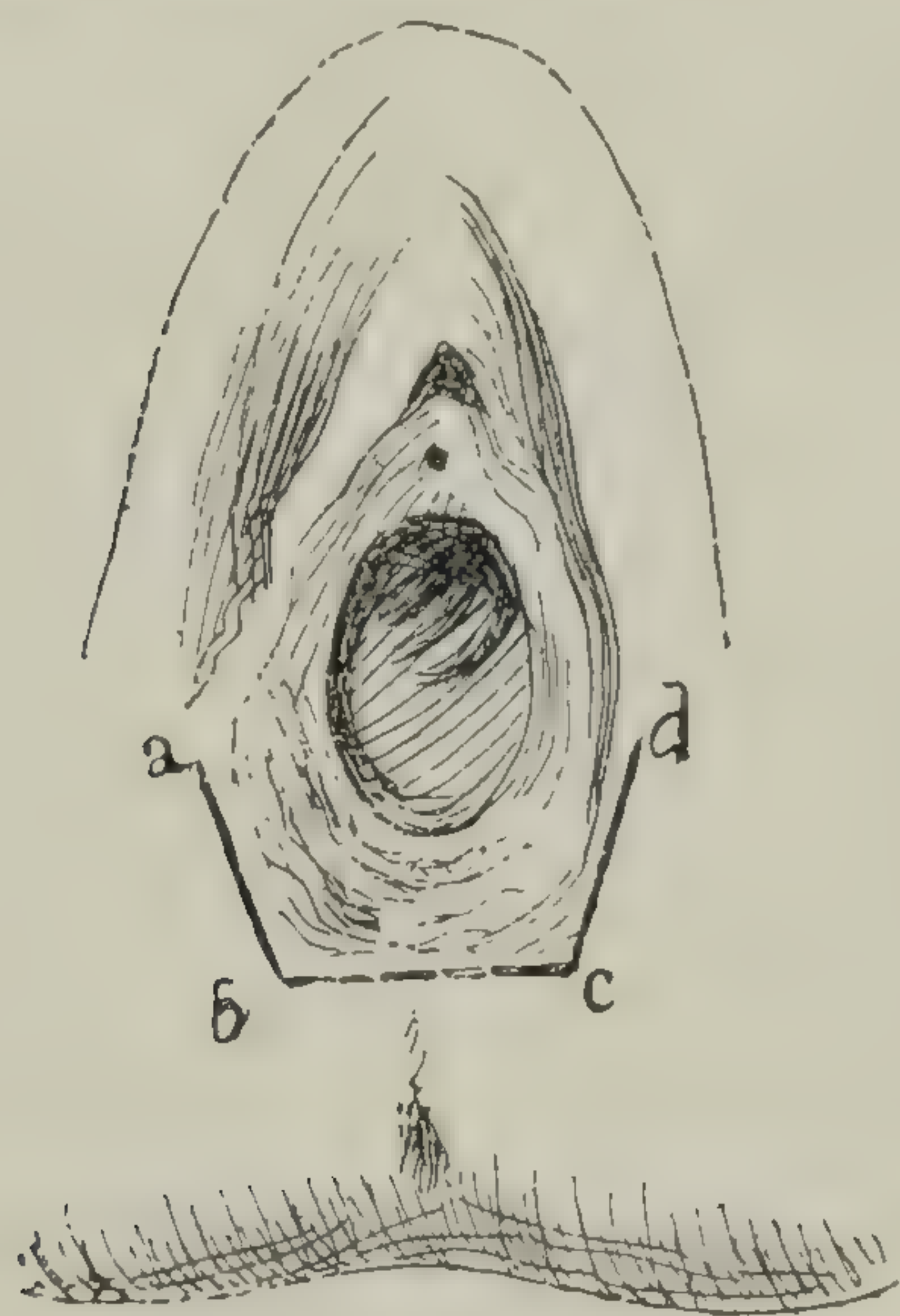


FIG. 44. Showing line of incision in incomplete laceration.

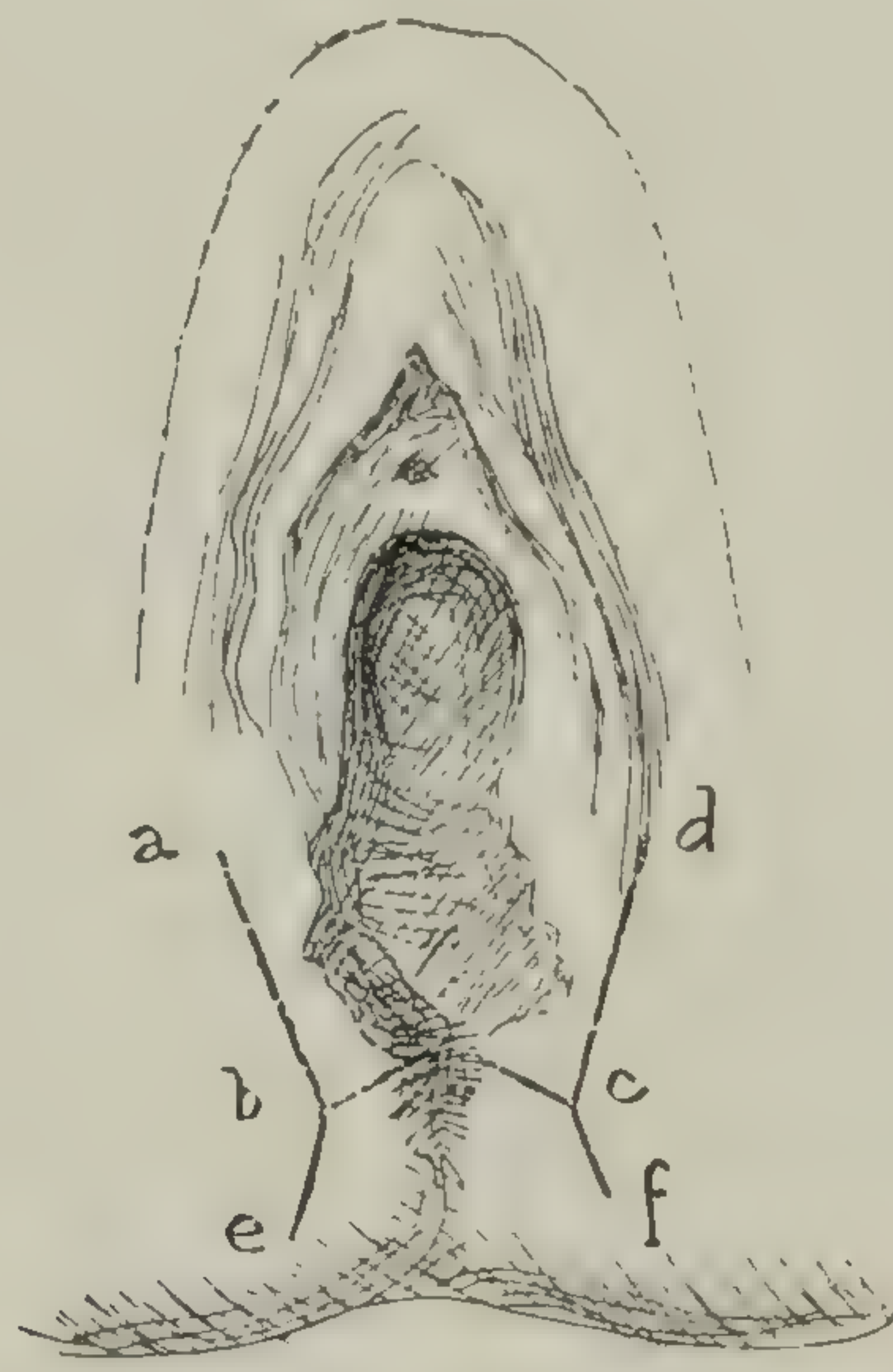


FIG. 45. Showing lines of incision, c f, b e, extending downward so as to expose the ends of the torn sphincter ani.

**PARTIAL LACERATION.** The patient should be placed in the lithotomy position and the legs supported by assistants or leg-holders. If the operator now place a thumb on each side of the lower extremity of the torn commissure and by separating them puts the tissues somewhat upon the stretch, he will notice a distinct white line at the juncture of the skin of the perineum and the cicatricial mucous membrane covering the tear. He should then so place the fingers of his assistants that this white line is brought prominently into view, and that the two sides are drawn upon equally so as to have no distortion. The scissors should next be entered at one end of this line and flaps made by cutting across to the other extremity (Fig. 44). The incision should



then pass up upon each side to the lowest caruncula myrtiforme. The transverse incision and the two ascending continuations make three sides of an irregular rectangle, and constitute the beginning of a splitting of the recto-vaginal septum. The vaginal flap is now seized at its center with a tenaculum or forceps and the separation continued up the septum until a point is reached corresponding to the upper portion of the visible rectocele. This will be at a depth, usually, of an inch and a half or two inches, sometimes more. This operation, which is known as the flap-splitting operation, has fallen into disrepute in the minds of many

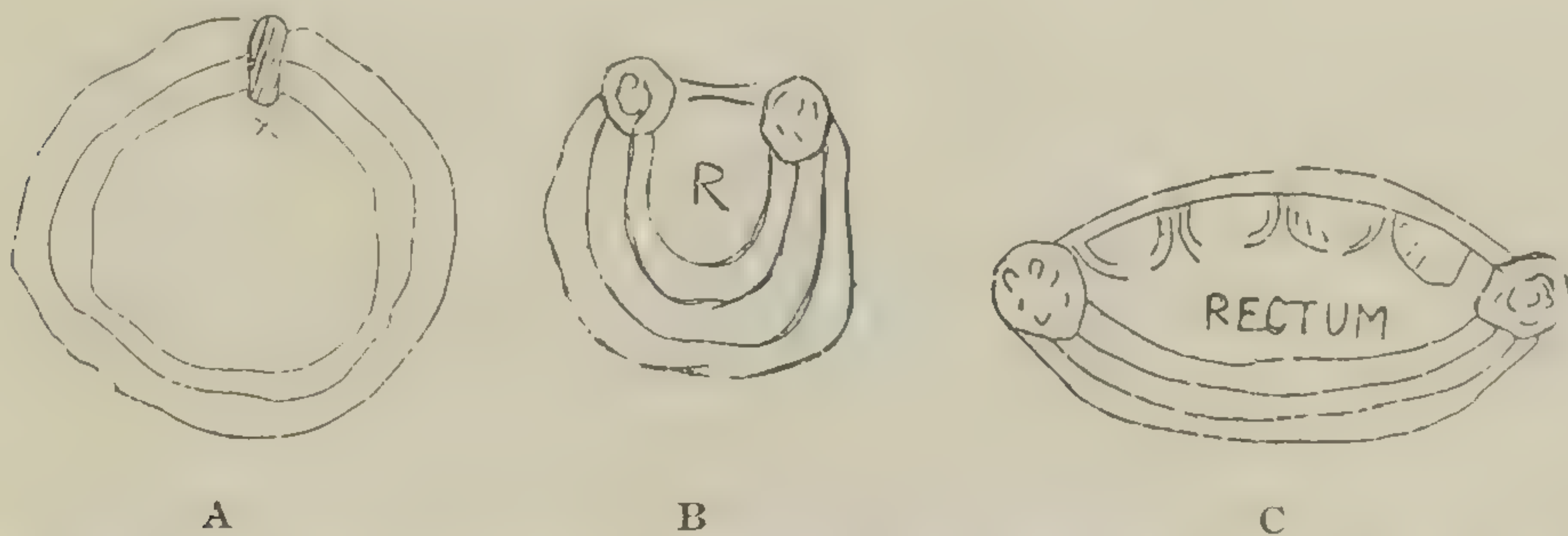


FIG. 46. At *a* is shown a diagram representing the sphincter ani which has been torn but has healed so completely as to give rise to no inconvenience. *b* represents the sphincter with only partial union, but sufficient to give retention of feces under ordinary circumstances. *c* shows the ends of the sphincter widely separated, the muscle itself spread out into nearly a straight line, and resulting absolute incontinence of feces.

surgeons simply because the separation has not been carried deeply enough. Many operators have been content to carry it to a depth of not more than a half inch. If the parts are then approximated a very good looking, but only skin-deep, perineum is produced and the operation, so far as supporting the parts is concerned, is a perfect failure. If, however, the separation is carried as deeply as I have indicated, and the parts are then brought into proper apposition, as described later on, the resulting perineum will be entirely satisfactory. The finger alone will not always be sufficient to separate the two surfaces, as there will be bands of tissue running across which must be snipped with the scissors, but most of the separation will be easily accomplished by the two index fingers. There is sometimes quite free hemorrhage from the deeper parts, but this can ordinarily be con-



trolled by hemostatic forceps. If a ligature becomes necessary, fine catgut should be used. The vaginal, or upper, and the rectal, or lower, flaps should now be seized in their centers and separated as widely as possible by tenacula or forceps preliminary to the passage of the sutures. If the operation has been made in a case in which there is no rectocele and in which, therefore, the dissection has not been deep, the stitches may be passed from side to side with an ordinary perineum needle, care being taken to embrace a goodly mass of structure upon each side, although the needle should enter and emerge through the skin a slight dis-

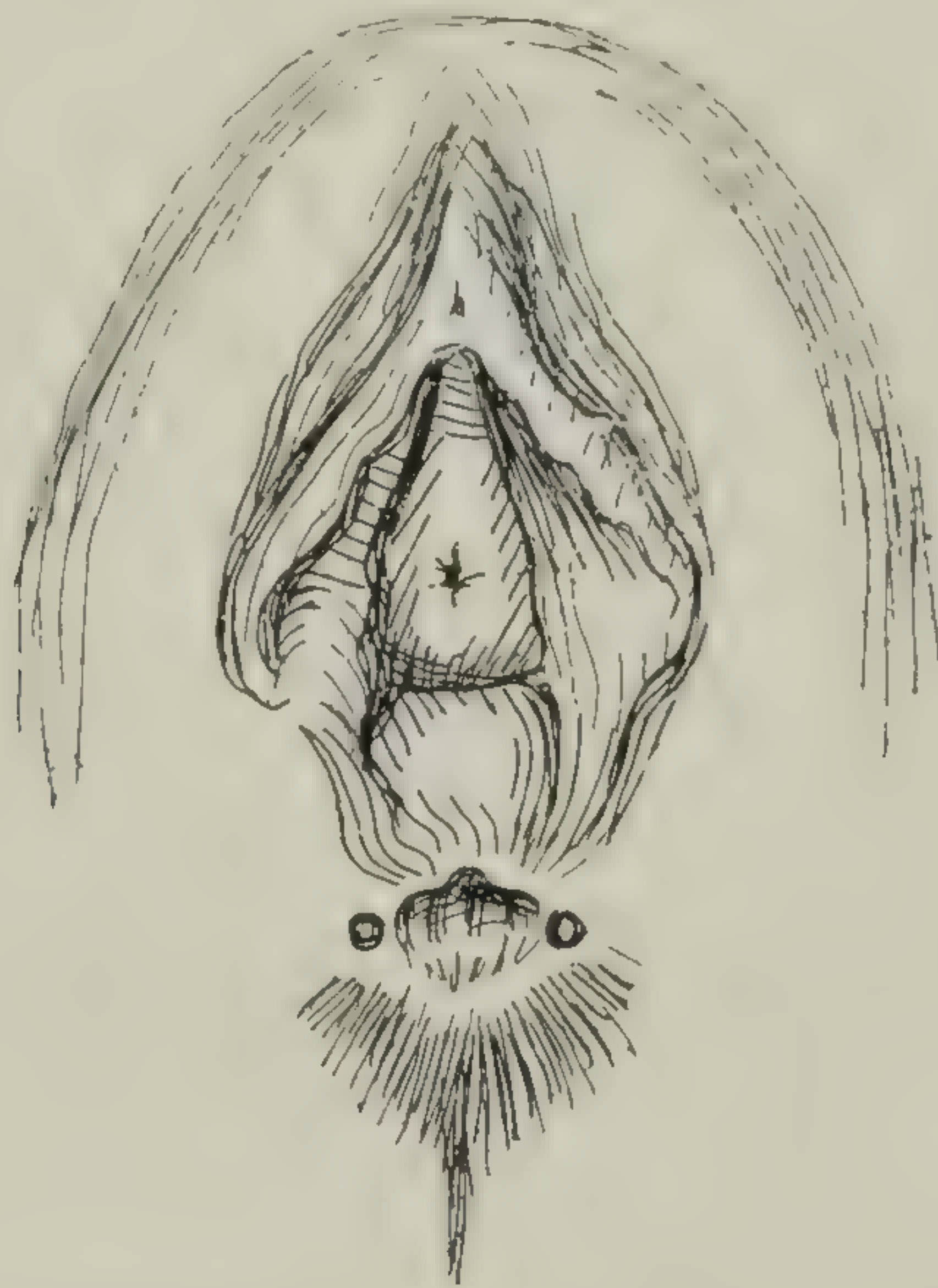


FIG. 47. Showing old complete laceration with puckered appearance over the torn and contracted sphincter ani. The dots indicate the dimples which appear at each end of the muscle.

tance only from the margins of the wound. The needle should be so passed that it is buried through all, or nearly all, of its course. In cases of incomplete laceration, from four to six stitches should be introduced. These are preferably of silk-worm gut. The stitches should, ordinarily, be inserted nearest the anus first. As each suture is inserted its ends should be caught with a hemostatic forceps, which is then allowed to hang down so as to keep them out of the way entirely of the succeeding manipulations. By the time the stitches are all in place oozing has probably entirely ceased and the operator at once proceeds to tie the



sutures, after carefully cleansing the surface of the wound. The surfaces should be drawn snugly together, but the stitches should not be too tight, and care should be exercised that the skin is not turned in along the line of suture. If there is any separation of the skin between the stitches a few adjustment stitches of catgut can be introduced. At the extreme upper end of the incision the vaginal mucous membrane will be found making a sort of redundant tab. This may be snipped off, or its edges brought to-

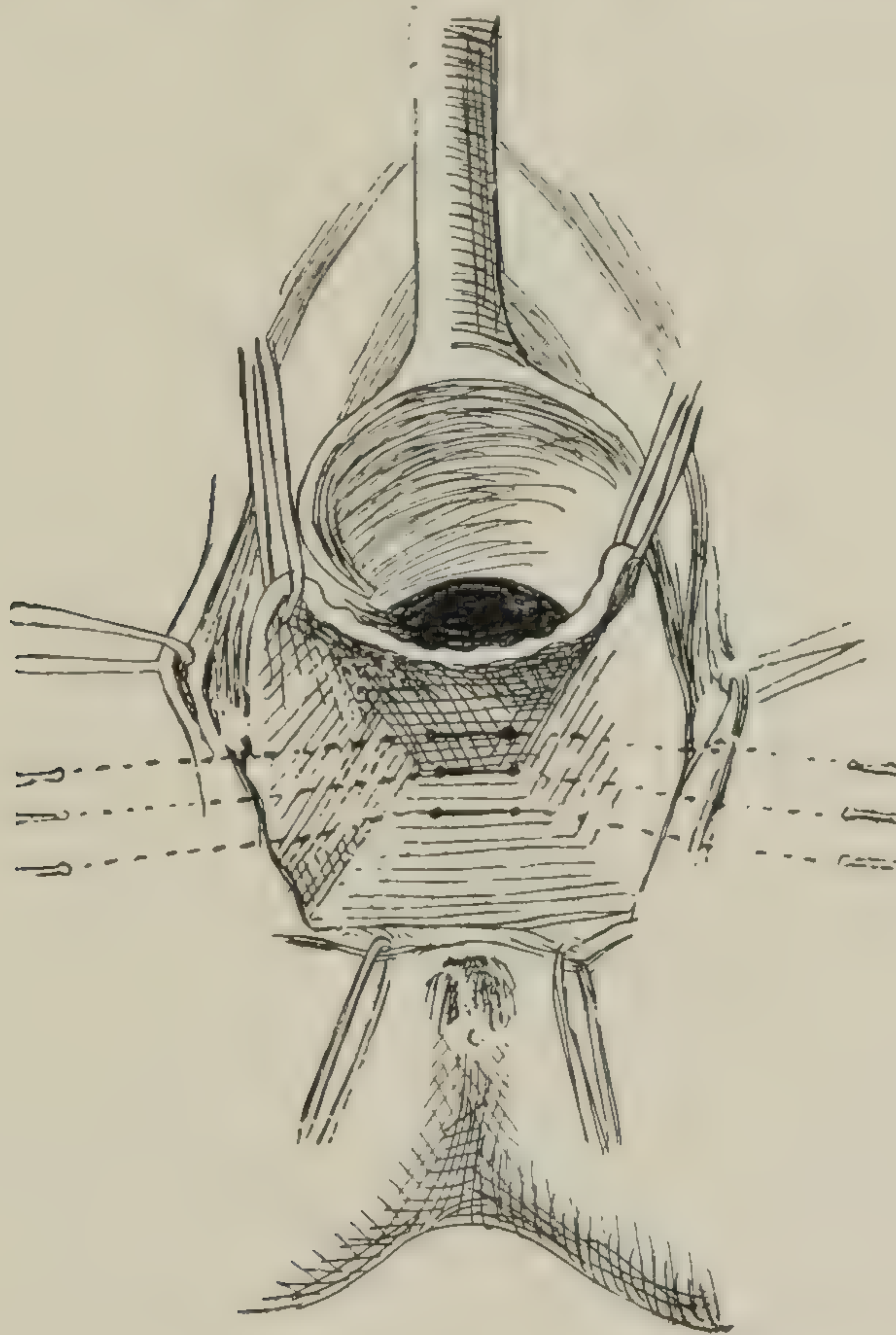


FIG. 48, Illustrating deep splitting of the flaps with the introduction of stay sutures to secure approximation of the deeper portions of the wound. If preferred this approximation can be secured by buried animal sutures.

gether by a continuous catgut suture, when, by the time healing has taken place or soon after, this apparent redundancy of tissue will be no longer manifest.

**COMPLETE LACERATION.** In this laceration the sphincter is involved as well as usually more or less of the recto-vaginal septum, and a somewhat different procedure is necessary.



As the anus has been torn in these cases for several months, or frequently for many years, the sphincter ani muscle has become contracted and is practically a straight muscle lying just behind the margin of the anus. The thumbs should be introduced through the anus, the tissues seized upon each side between the thumbs and fore fingers, and by a sort of milking or stretching process the muscle should be stretched forcibly, and to a certain extent paralyzed, so that it will not contract too vigorously before union shall have taken place between its divided ends. The sphincter having been thus prepared, the transverse incision should be made as in the repair of the incomplete laceration, except that this incision is made to split the edge of the recto-vaginal septum. If the recto-vaginal septum is lacerated to a greater or less extent, the splitting process must follow the edges of the laceration. Incisions are then made upward along each side of the vulva, as in the first operation, and others downward, the latter being made so deep as to expose thoroughly the torn ends of the sphincter ani muscle. The recto-vaginal septum must be separated as thoroughly as necessary, as in the first operation. The mucous membrane of the rectum, in case the septum has been lacerated, should then be carefully brought together by interrupted sutures of fine silk or catgut, the first suture being introduced at the upper angle of the laceration and so tied that the knot is in the bowel. The other sutures should be applied in order from above downward and, as with the first, with the knots on the bowel side. The rectal wall having thus been closed, deep sutures are carefully passed so as to embrace each end of the sphincter muscle. Usually two stitches will be necessary to carefully approximate these ends. These stitches having been introduced, the remaining sutures are inserted as though the laceration had originally been incomplete.

In case the dissection required is a deep one, owing to the presence of a marked rectocele, the sutures, if inserted as above described, will not bring into satisfactory apposition the deeper portion of the wound. For this purpose one or two, or occa-



sionally three, deep wire sutures should be passed from side to side, these sutures entering and emerging an inch or more from the margins of the wound. (Fig. 48-9). After these are inserted the silkworm gut sutures should be entered as in the operation for incomplete laceration. When all are inserted and all oozing has ceased, the silver wires should be passed through pledgets of

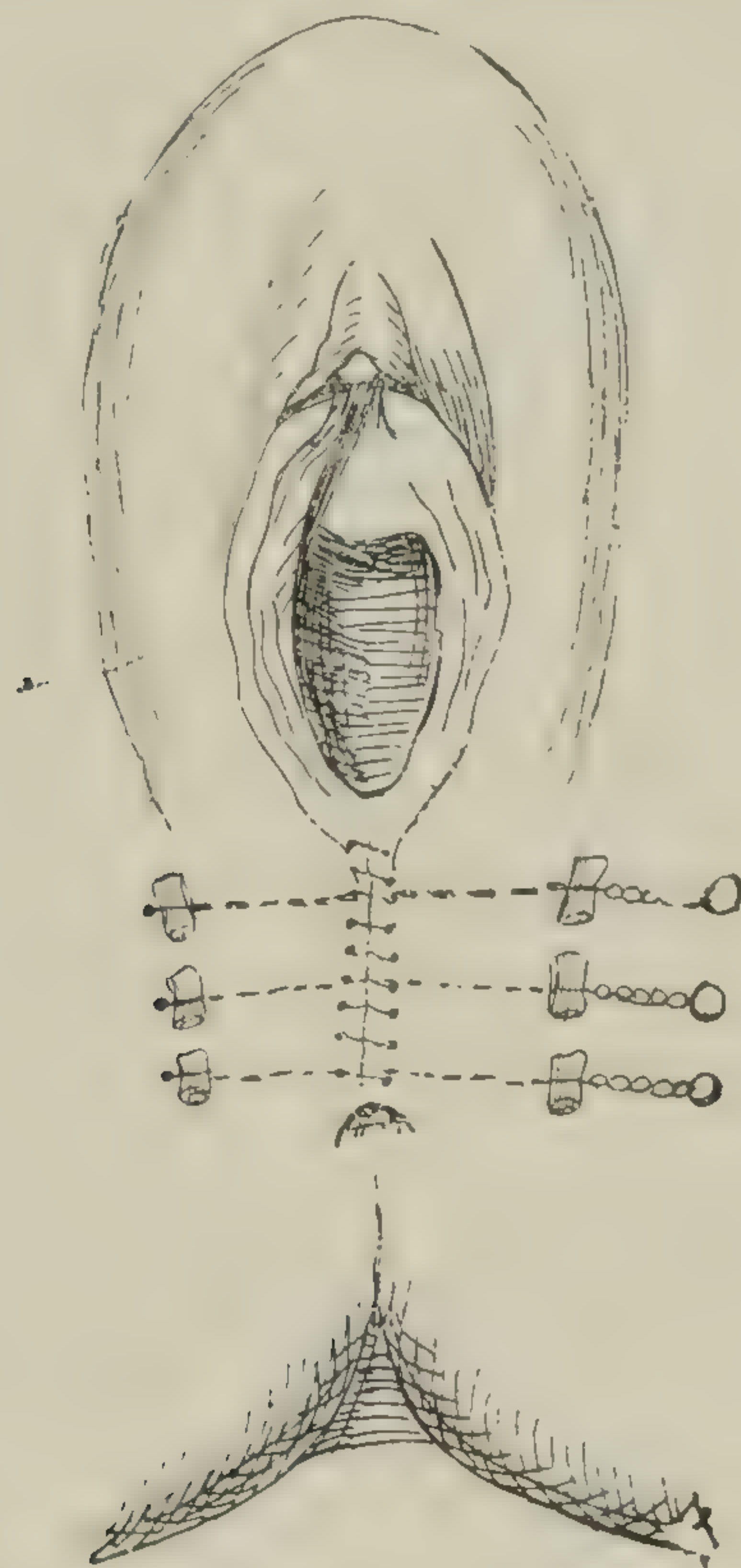


FIG. 49. Showing complete operation with the stay sutures tightened and the superficial sutures inserted.

iodoform gauze and the deep surfaces brought into apposition by the fixing of shot on the projecting ends. The presence of the gauze is to protect the skin from any injurious pressure of the shot. The deep portions being now apposed, the silk-worm gut sutures are tied, and approximation sutures introduced, if necessary, to secure thorough apposition of the skin margins.

In separating the vagina and rectum the separation should be carried well into the tissues on each side, running a little upward along the lateral walls of the vagina and backward along those of the rectum, so that a good approximation may be se-



cured. If the required dissection is unusually deep, the sides should be brought together with catgut or kangaroo tendon, carried in with a rather sharply curved needle, which should be so introduced as to catch not only the tissues on each side, but a little of both the vaginal and rectal walls, so as to leave no pockets for the retention of blood. This suture may well be continuous, and should be brought forward until a point is reached where the ordinary stitches will secure satisfactory apposition.

The operation, whether for the complete or incomplete laceration, being now completed, the ends of the silk-worm sutures are fastened together by a wisp of cotton twisted around them and held in place by a ligature, and fixed in one groin by a bit of adhesive plaster so as to be out of the way in applying the dressings and so as to avoid soiling by fecal discharges. A catheter is now introduced into the bladder and the entire field of operation enveloped in protective dressings of iodoform gauze and cotton. A strip or two of gauze should have been inserted into the vagina, so as to absorb any discharges from that source.

The diet of the patient for two or three days before the operation and for several days after should consist of as little solid matter as possible, so as to reduce to a minimum the amount of feces. The bowels of the patient should be opened not later than the fourth day. This should be done by the administration of such cathartics as will produce soft evacuations, and the first evacuation should be anticipated by an enema of warm water containing a little soap and glycerine or ox-gall. The first evacuation is thus softened so as to be discharged without any overstretching of the newly-made sphincter. As the dressings will be disarranged by the manipulations necessary in securing this movement of the bowels, and as partial union has already taken place throughout the extent of the wound, the continuous use of the catheter may be dispensed with and the reapplication of dressings need not be as extensive and thorough as at first. The urine should still be drawn at stated intervals and the bowels should be opened thereafter at least once daily. The patient should be en-



joined to abstain from any straining efforts to secure a movement of the bowels, and if any such effort seems necessary an enema should be given to obviate it. The stitches may be removed at the end of ten days, though if they are giving rise to no irritation the shotted wires and the sutures through the sphincter muscle may be allowed to remain for a few days longer.

In all cases of central laceration of the perineum it will be necessary to incise the small amount of tissue remaining between the new opening and the vagina so as to convert the laceration into the ordinary form.



## CHAPTER XI.

### LACERATION OF CERVIX.

LACERATION of the cervix is a frequent and usually unavoidable accident connected with parturition. While it generally takes place only at full term labor, it is not infrequently found following abortions, and even as early as the second or third month. It seems to matter very little how small the transmitted body may be, if the fibers of the cervix do not soften and yield laceration takes place. It is easily within bounds to say that at least one-half of all the women who have had children have more or less laceration of the cervix. The laceration is usually slight and shows itself merely by one or more notches of the os. Laceration of sufficient depth to require surgical interference does not occur probably in to exceed ten per cent. of parous women.

ERGOT. One of the most frequent causes of lacerated cervix is unquestionably the injudicious administration of ergot during labor. The action of this drug is so uncertain, so variable, and so frequently disastrous in its results that, in my judgment, it should never be administered in connection with childbirth. It may possibly do no particular harm if given after the completion of labor, but its effect, if administered before this time, tends to be bad, and wholly bad.

VARIETIES. Lacerations are distinguished as unilateral, bi-

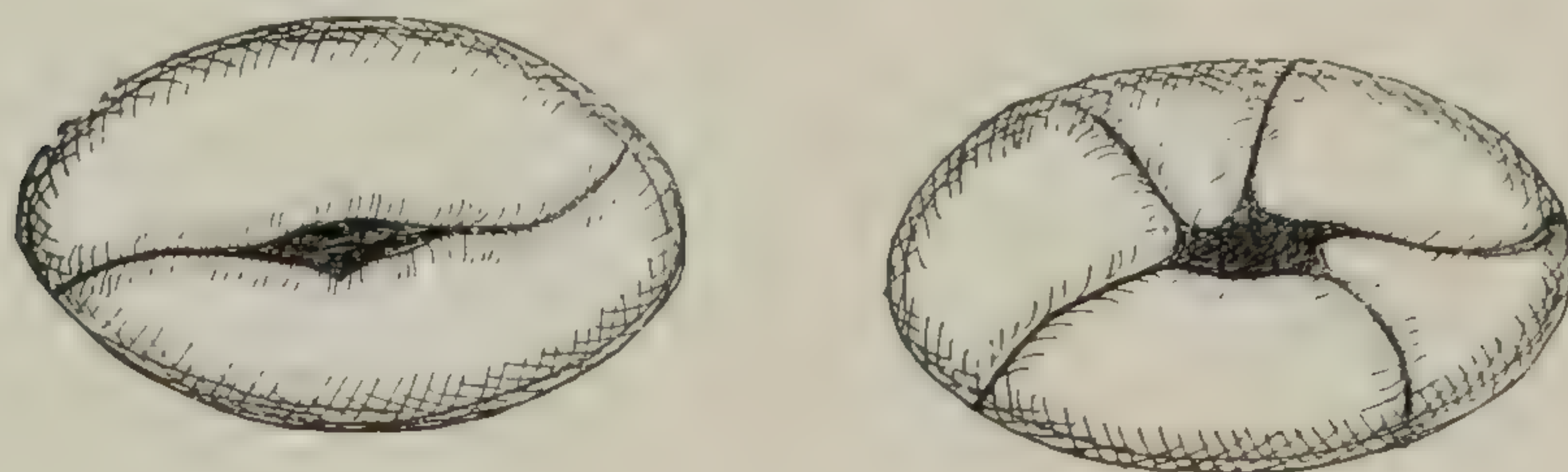


FIG. 50. Bilateral and stellate lacerations of the cervix.

lateral, anterior, posterior, and stellate, or multiple (Fig. 50). (Laceration sometimes takes place without the os itself being



involved, but only the deeper portion of some part of the cervical wall.) The most common variety is the unilateral; next to that the bilateral.

The laceration may vary from the slightest notch that can hardly be detected to a laceration extending through the entire cervix and deeply into the broad ligament.

While the passage of the child's head is usually the cause of the laceration, among other causes may be mentioned the premature application of forceps and the use of mechanical dilators.

SYMPTOMS. Following the laceration there may be such perfect restoration of the parts as to give rise to no symptoms whatever. If, however, the laceration is extensive, there will almost certainly occur some local infection leading, as a rule, to more or less acute, followed by chronic, metritis. As a result of this, involution fails to take place and there may develop a chronic hyperplasia, with eventually more or less prolapse. If the body of the womb does not become affected, the cicatricial tissue which forms as healing takes place may, by the involvement of nerve ends in the contracting scar, cause various pains and a variety of reflex nervous phenomena, among which neurasthenia is prominent. Sooner or later eversion of the lips of the cervix takes place. This condition, known as ectropion, is what the older gynecologists called "ulceration" of the womb. The symptoms, therefore, of laceration are simply those of the resulting conditions and consist chiefly in leucorrhea, with a dull, heavy, dragging pain in the lumbar and sacral regions, or throughout the entire pelvis. There is frequently more or less hemorrhage at the menstrual periods. Sterility or early abortion is common. Usually there is more or less soreness complained of in the womb, while hysterical and other reflex nervous manifestations are very common. On the other hand, many cases of laceration exist for years without producing any noticeable symptoms.

True ulceration of the surface exposed by laceration of the cervix is sometimes found and is a result of excessive irritation. It is certainly a very rare condition.



DIAGNOSIS. The finger of the examiner is usually sufficient to determine the condition present. The laceration or lacerations can be felt with more or less hard cicatricial tissue where healing has taken place. If the laceration is at all extensive the finger may easily enter the cervix. It should be borne in mind that in nulliparous women suffering from endo-cervical catarrh, there may be a patulous condition of the external os closely simulating that which is found where a moderate laceration exists. Caution is therefore necessary in making a positive statement of the condition present in such cases.

TREATMENT. Palliative treatment is of material advantage in these cases, and is frequently a necessary preliminary to operative procedures. It is generally the case that the parts are considerably inflamed and hardened, and some local treatment is quite necessary to bring them into a condition most conducive to successful operation. There should, therefore, be directed free douches of very hot water, and tampons saturated with glycerine or with boroglycerin should be applied to the cervix about three times a week and allowed to remain for a day or night. Where the cervix is much swollen and the Nabothian follicles enlarged, preliminary puncturing of the cysts and the scarification of the cervix are very beneficial. This preliminary treatment will sometimes be required for six weeks or two months. In case, at the end of this time, it is evident that the inflammatory changes are too deep-seated to be thus removed, amputation of the cervix will be necessary.

An operation for the closure of the laceration is always essential in marked cases. This operation is technically known as *trachelorrhaphy* (Fig. 51). The preparatory treatment immediately preceding the operation is that which should be used in all vaginal work. The patient should then be placed in the exaggerated lithotomy position, or, if preferred, in that of Sims. The perineum being retracted the cervix should be moderately drawn down with the bullet forceps or tenaculum. If there is much hyperplasia of the cervical mucous membrane the sharp curette



should be freely used for its removal. If there has been an endometritis, the cervix should be dilated, the endometrium thoroughly curetted, and the cavity cleansed and swabbed with pure carbolic acid or iodized phenol (iodine crystals, half oz.; carbolic acid, crystalized, two oz.; water, two drachms. Combine by gentle heat).

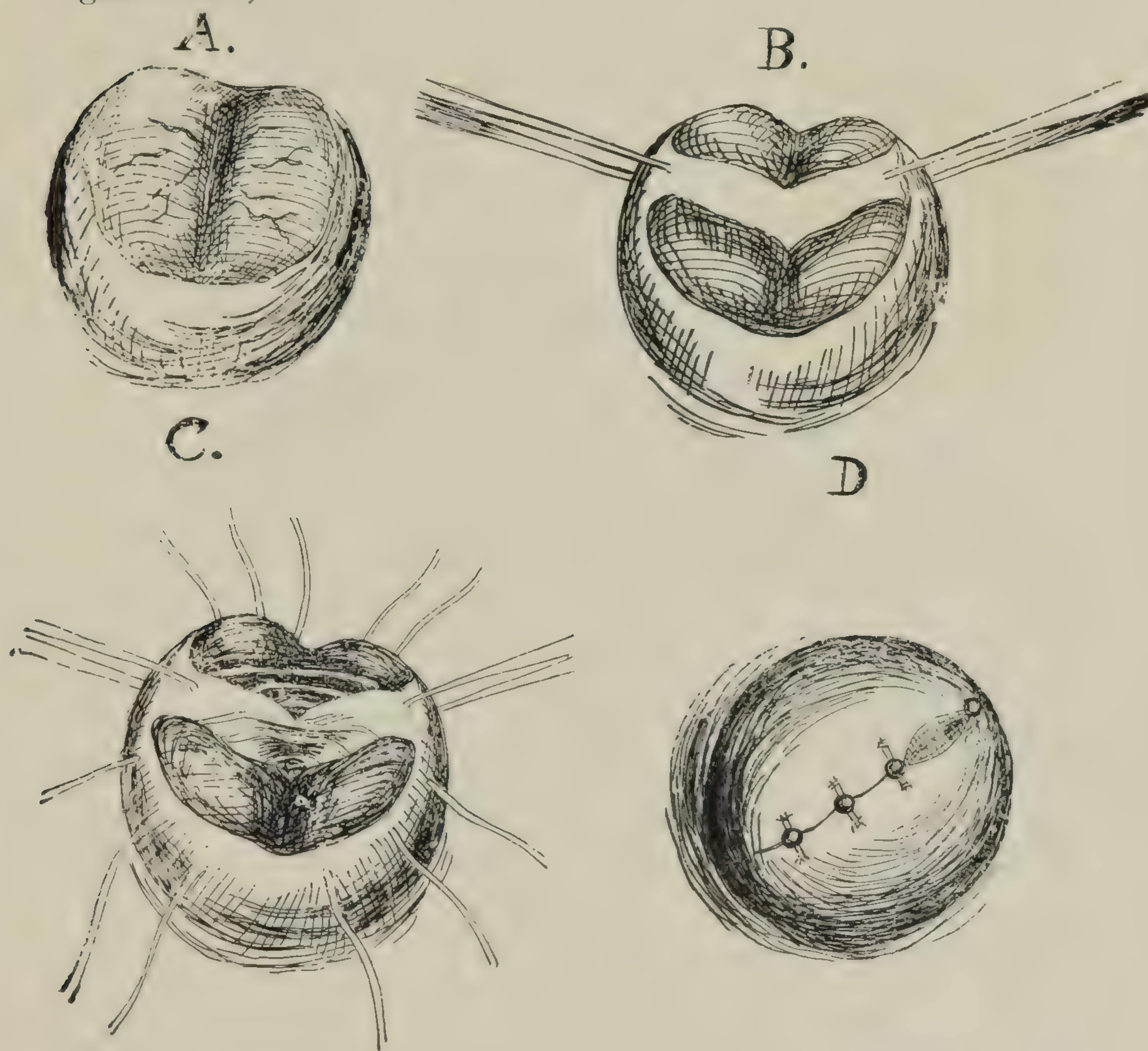


FIG. 51—*a*. Bilateral laceration of the cervix.

- b*. The same denuded ready for insertion of sutures. The undenuded strips for the future canal are held in the forceps.
- c*. Sutures inserted ready for tying.
- d*. Sutures tied and operation completed.

With a long-handled scalpel, slightly curved on the flat, or scissors similarly curved, the hypertrophied tissue covering the site of laceration should be removed. This should be removed



in one piece, so that there may be no doubt as to the entire denudation. Care should be taken to remove all cicatricial tissue in the angle of the tear. The denudation must not involve the entire surface of the lips, but a strip should be carefully left on each lip, so that when the stitches are introduced the cervical canal may be reproduced. If the denudation required is quite deep there will probably be considerable hemorrhage from the depth of the incision. It may be necessary to introduce a catgut ligature to control this, but ordinarily it is controlled by the insertion of the deepest suture. The material used for sutures may be either silk, silver wire, kangaroo tendon or catgut. Silk-worm gut has sometimes been used, but it possesses many points of disadvantage. Kangaroo tendon is probably the best material

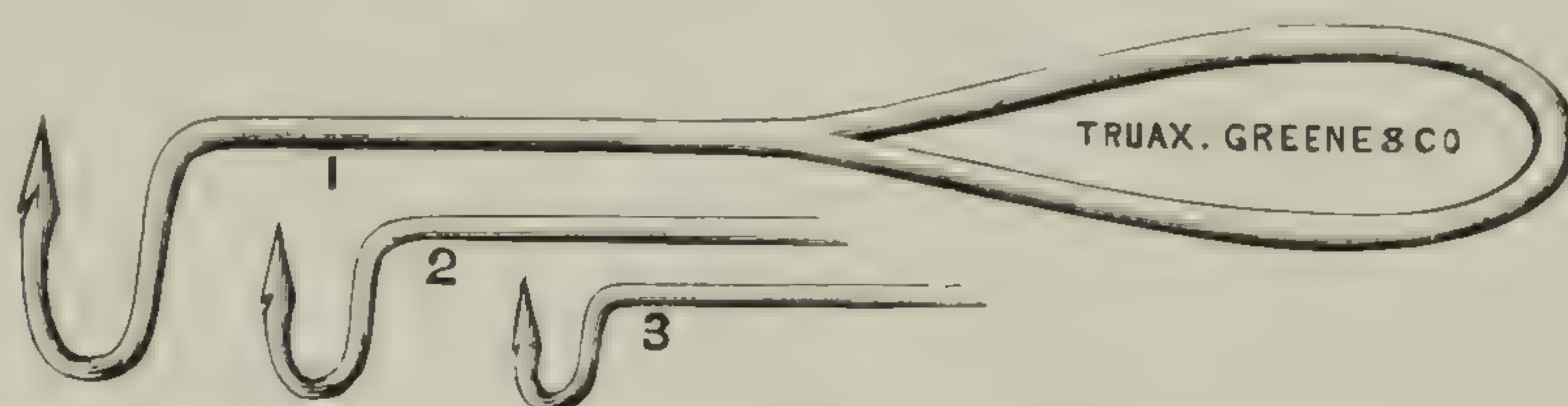


FIG. 52. Handled needle with hook for introducing sutures in trachelorrhaphy. The needle is more slender than indicated in the cut.

to be used, as it is amply strong and at the same time requires no removal. Care should be taken in introducing the sutures to pass them so deeply as to embrace practically all of the denuded surface. Inexperienced operators occasionally bring them out so as to catch little more than the mucous membrane of the vaginal portion of the cervix. Even under those circumstances the deeper portions may satisfactorily adhere, but ordinarily a ballooning of the cervix takes place with unsatisfactory results. Three or four stitches will probably be necessary on each side in case the laceration is bilateral. In introducing the stitches a needle and a needle holder may be used, but I prefer the handled needle with the hook (Fig. 52) instead of eye. This needle is quite manageable, is readily introduced, and may be made to embrace both flaps at once or each separately. The kangaroo tendon is easily slipped into the hook and the needle withdrawn. After completing insertion of the stitches the



vagina should be cleansed and iodoform gauze packing introduced. By protecting the gauze at the vaginal outlet by a tampon filled with vaseline it will not be necessary to use the catheter. The tampon should be changed after each urination.

In unilateral laceration it is sometimes necessary to incise the opposite side so as to properly denude the affected portion and satisfactorily introduce the sutures. If the laceration is stellate each laceration must be separately closed, unless, as is sometimes

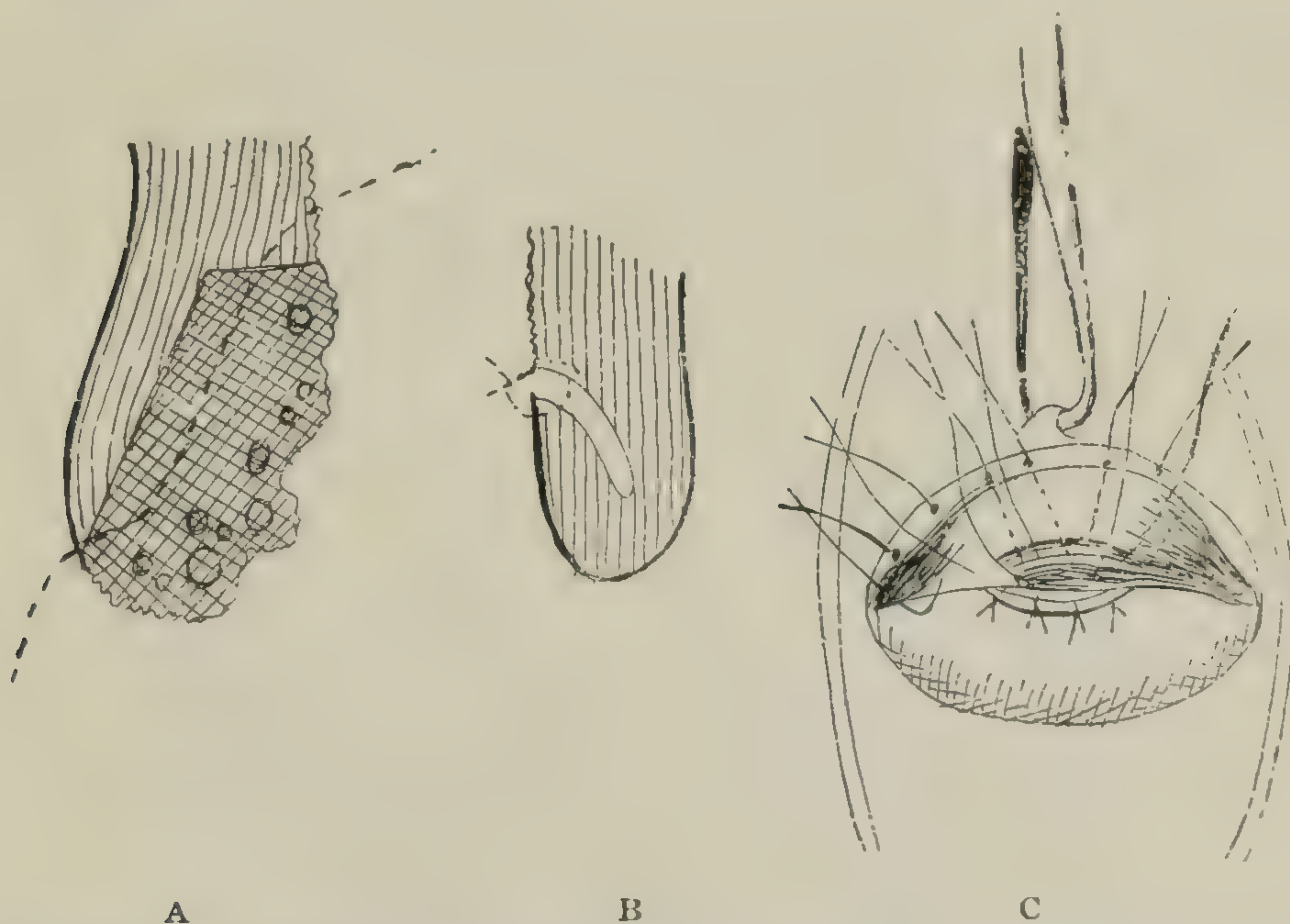


FIG. 53. Schroder's operation for amputation of the cervix.

- a.* Showing tissue to be removed and the points of introduction of the suture.
- b.* The flaps brought together and suture ready to be tied.
- c.* Sutures on one side tied, the others in place.

possible, by excising the intervening portion of tissue two lacerations may be thrown into one. If the laceration is incomplete, being limited to the inner portions of the cervix and not showing upon the outside, it will be necessary to incise the remaining tissues so as to make a complete bi-lateral laceration, which should then be treated as though originally in this form.

The operation, when properly performed, is, barring accidents, entirely devoid of danger. Healing takes place by immediate union and without the formation of cicatricial tissue. The same causes that operated to produce the original laceration may



result in its reproduction, but usually dilatation is safely accomplished.

**AMPUTATION OF CERVIX.** In cases of multiple laceration, or in cases in which there has been, as a result of a simple laceration, great hyperplasia of the cervix, amputation may be the only recourse. The depth at which the amputation should be made will depend entirely upon the conditions present.

If the external surface of the cervix is comparatively healthy, Schröder's operation. (Fig. 53) should be performed. The parts

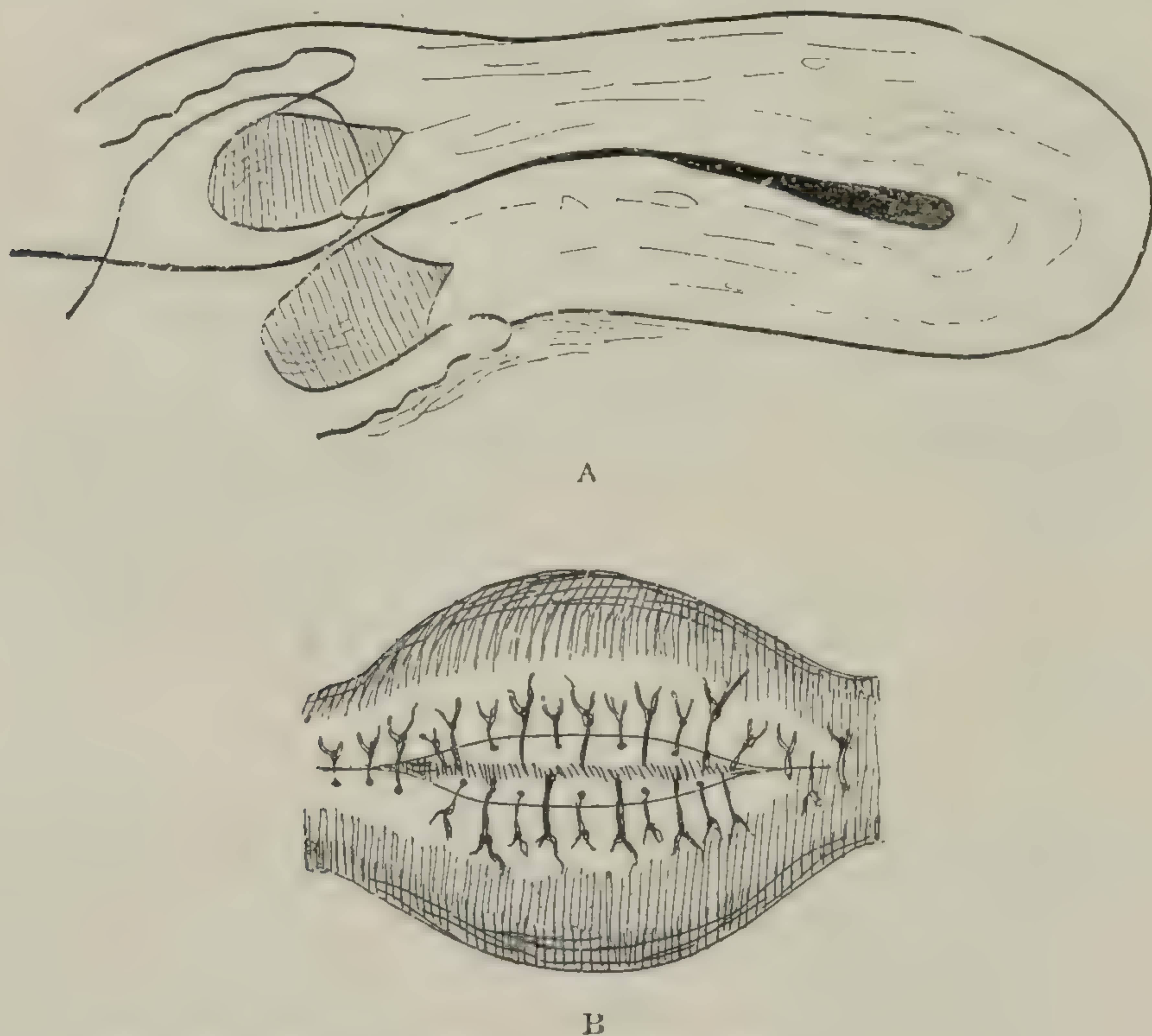


FIG. 54. Simon's operation for laceration of the cervix.

*a.* Showing the lines of exsection.

*b.* The completed operation with sutures fastened.

being exposed, a bilateral incision is made, splitting the cervix into anterior and posterior flaps. The anterior flap should be seized with bullet forceps in its middle, so as to bring the field of operation well into view. The posterior flap is then split down, so as to separate the healthy tissue toward the vagina from the hyperplastic tissue next to the cervical canal. This separation is carried as far toward the internal os as necessary, and then the



cervical flap is removed by a transverse section, the line of section being directed somewhat upward, so as to leave a projecting lip. With catgut or kangaroo tendon sutures the two edges of the incision are now united so as to restore the posterior lip of the cervix. This posterior lip is now caught with the forceps or a tenaculum and a similar operation performed upon the anterior lip. A little trimming up of the flaps is necessary at each angle, so as to get good apposition and a satisfactory restoration of the external os.

In cases in which the entire cervix is involved, Simon's operation (Fig. 54) is indicated. The cervix is split as deeply as

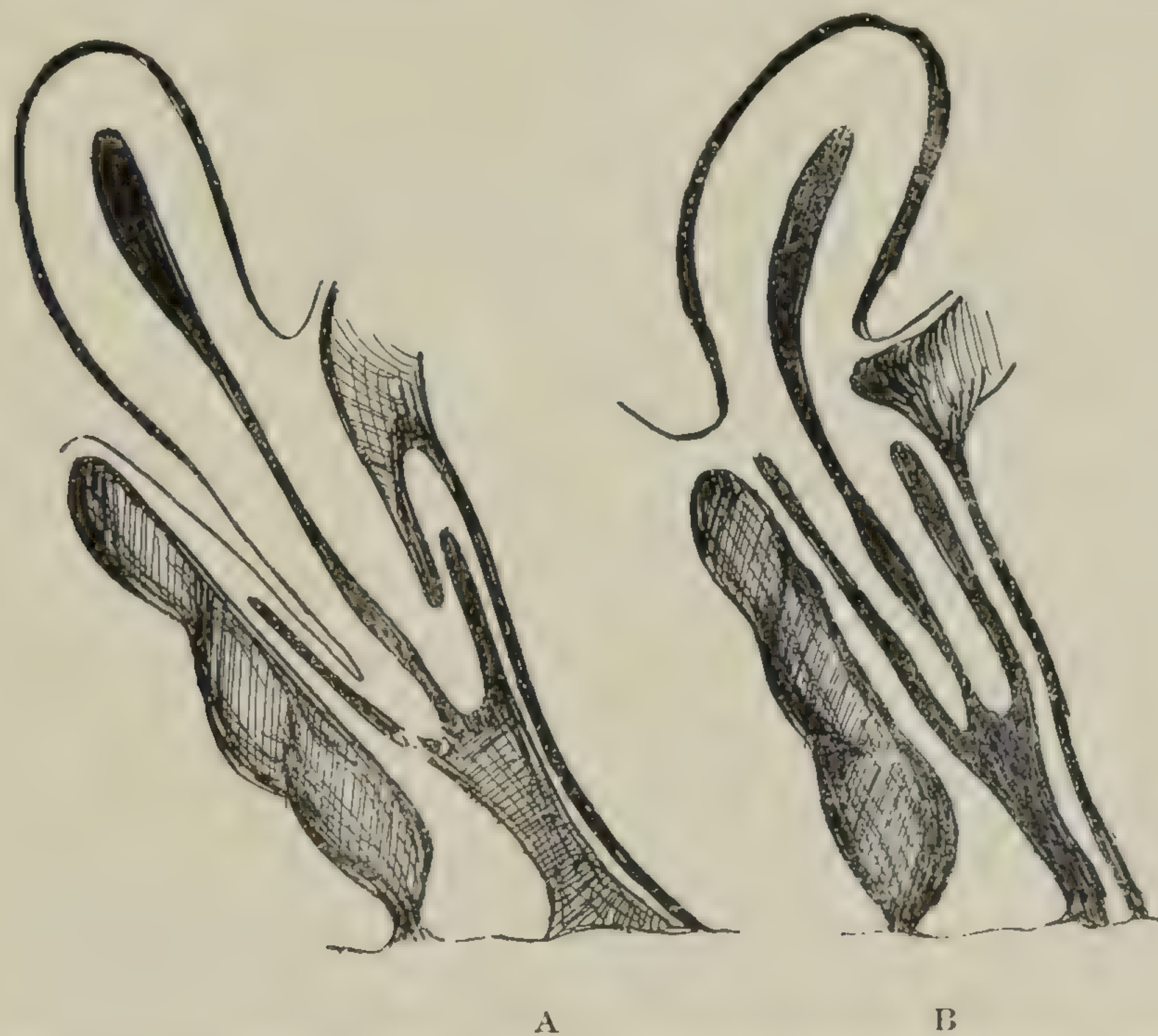


FIG. 55. *a.* Supra-vaginal, and *b.*, Infra-vaginal elongation of cervix.

necessary, as in the previous operation. The two flaps are then excised by transverse incisions extending upward and uniting in about the middle. These flaps are easily brought together with kangaroo tendon, or catgut, and the external os restored, as in the former operation.

Previous curetting of the endometrium should be made in all these cases if there is evidence of endometritis. If the disease,



however, is limited to the cervix there should be no interference with the uterine cavity.

The results of the operation are very gratifying. Not only is the hypertrophied cervix removed, which has been the source of a large number of symptoms and has led to more or less prolapse, but the secondary effects in the body of the uterus, such as endometritis and metritis with hyperplasia, as a result of the curetting and removal of the irritation below, gradually disappear. The full benefit of the operation will not usually be manifest until the lapse of several months.

ELONGATION OF CERVIX. The cervix is sometimes affected by hyperplasia manifesting itself by great elongation of this portion of the uterus (Fig.55). The cause of this hyperplasia, except when it is the result of prolapse, is not infrequently quite uncertain. The elongation may be supra-vaginal, in which case the fundus of the uterus will be found high up, or it may be infra-vaginal, the elongation in the latter case sometimes being so great that the cervix protrudes at the vulva. Amputation of the cervix is the proper treatment.



## CHAPTER XII.

### METRITIS.

**I**NFLAMMATION of the womb is due to a variety of causes, and in general presents itself as a simple congestion or engorgement, with or without edema; as hypertrophy or sub-involution; or as granulation and ulceration, involving either the cervix or fundus. According to the stage or character of the disease it may present itself as an acute inflammation, or as hemorrhagic, catarrhal or simply chronic. No sharp line can be drawn between acute and chronic inflammatory conditions, nor does the inflammation so limit itself to any one structure as to be definitely established as an endometritis with or without parenchymatous involvement.

**ETIOLOGY.** In a general way it may be said that all uterine inflammations, like inflammations elsewhere, are due to microbic infection. The most common sources of infection are unquestionably those connected with gonorrhea and those which, from any cause, follow a pregnancy, whether at full term or interrupted. Aside from the gonorrheal microbe the streptococcus pyogenes, alone or mixed, may be regarded as the cause of all these infections. Any condition or accident which brings these bacteria into contact with uterine tissue may be regarded as an essential factor in the infective process. Among these causes may be mentioned menstruation, which not only produces a congestion of the uterus, thus furnishing a suitable nidus for the development of pathogenic microbes, but also by establishing a nutrient material from the vulva to the cervix furnishes abundant opportunity for migration.

While excessive coitus is usually assigned as a factor in the causation of uterine inflammation, it is much more likely that this cause so acts merely from the introduction of the infection of either an acute, or, what is more frequently the case, a chronic



gonorrhea. Microscopic and bacteriologic researches have long since established the fact that, in a large proportion of cases, a gonorrhea, perhaps long since regarded as cured, and even forgotten, is the immediate source of infection.

Following parturition at full term, and even more particularly abortions, whether induced or not, the uterus is in a state of congestion, with usually more or less traumatism, and therefore in a condition most suitable for microbic infection of rapid development. This is especially true if, for any reason, a bit of placenta or membrane remains partially adherent. The decomposing tissue furnishes the best possible nidus for the development of bacteria, and the intimate contact of the infected tissue with the uterine surface renders avoidance of infection almost impossible, while its character and amount will depend upon fortuitous circumstances.

In addition to the traumatism which is the result of delivery, many other injuries are inflicted by the use of instruments, especially sounds, intra-uterine pessaries, etc. Even the finger of the examining surgeon may introduce infection through the slight trauma inflicted by an untrimmed nail.

It is probable that certain infectious diseases may at times manifest themselves in the uterus, as elsewhere. This is notably true of diphtheria and of some of the exanthemata.

Tubercular infection and the presence of neoplasms may be accompanied by more or less inflammation, but in these cases the metritis is secondary in character and, in itself, of little importance.

**SYMPTOMS.** The symptoms of acute metritis are fever, local pain and weight, leucorrhea, menorrhagia or metrorrhagia, together with disturbances of bladder and rectum, headache, backache, and more or less general malaise. As the tubes and ovaries are almost certain to be involved sooner or later, the pain will usually be found in the iliac fossæ as well as in the uterus itself. The pain is not usually severe, but on making vaginal examination marked tenderness will be manifested whenever pressure is



made upon the uterus or its appendages. Care must be exercised, even in introducing the nozzle of the syringe.

More or less leucorrhea is always present; this discharge being made up of the normal secretions of the mucous membrane, together with some pus and blood. As it appears at the vulva the discharge consists of secretions from the vagina, cervix and uterine body, the amount of discharge from each of these sources depending upon the character and height of the accompanying inflammation.

The discharge which accompanies the anemia of debility must be distinguished from that which is the result of inflammation.

The menstrual function is usually more or less disturbed, the flow being generally more profuse than usual and more painful.

Reflex disturbances of the bladder are quite common and are indicated chiefly by painful and too frequent urination. The disturbance may amount to a vesical tenesmus.

It should not be forgotten that respiratory, laryngeal and cardiac reflex disturbances are not uncommon accompaniments of metritis, as are also the diverse manifestations of hysteria.

Digital examination reveals enlargement of the uterus, together with undue tenderness. The manifestations of tenderness depend largely upon the temperament of the patient. In acute metritis the engorgement of the tissues results in marked swelling of the organ, although this enlargement is not so great as that which is found in the sub-involution which accompanies the chronic form of the disease. The passage of a sound shows increased uterine depth, but except under unusual circumstances, and then only with the most rigid precautions, should this instrument be used. The introduction of the speculum reveals a leucorreal discharge pouring from the external os, which presents itself as a swollen, hyperemic and pouting orifice, with or without evidence of laceration and accompanying erosion. If the inflammatory congestion is intense enough, the leucorrheal dis-



charge will be somewhat stained with blood, and quite a profuse hemorrhage may follow the use of the sound, or even bimanual examination.

In the chronic form there is an absence of the constitutional symptoms of acute inflammation. The organ is less tender and there is less tendency to hemorrhage. It is, however, painful and will be found enlarged and hard, rather than succulent. If, as is usually the case, there has been a laceration, ectropion of the cervix is marked. The leucorrheal discharge is usually rather scanty than profuse, and menstruation, on inquiry, will be reported less free than formerly and accompanied by more pain.

PROGNOSIS. Under vigorous antiphlogistic treatment, combined with rest and suitable hygienic requirements, most cases of acute metritis terminate favorably. Chronic metritis, on the other hand, in spite of all treatment, usually persists until the menopause, when usually, but by no means always, the atrophic changes which accompany that period slowly bring relief and cure.

This condition of chronic metritis is practically the same as that described by many authors under the name of subinvolution.

DIAGNOSIS. The local and reflex disturbances accompanying a somewhat acute metritis may closely simulate those of an early pregnancy. Under these circumstances, cautious treatment should be instituted until sufficient time has elapsed to settle the diagnosis.

Chronic metritis, especially when occurring in the latter decade of a woman's menstrual life, may sometimes be differentiated with difficulty from malignant disease. The discharge, however, of cancer is more watery in character than that of metritis and its odor is different. The accompanying ulceration results in destruction of tissue, with hard borders inclined to become somewhat nodular. This nodular condition, however, should not be confused with that due to the presence of cysts, which are caused to protrude by sclerotic hardening of the cervical tissues. Puncture of the cysts to evacuate their contents, and of the cer-



vix to relieve the congestion, will usually enable a correct diagnosis to be made. If the case is still in doubt, a wedge of the cervical tissue should be removed, with scissors or scalpel, and subjected to microscopical examination. Mere scrapings from the surface are almost valueless for such investigation.

Involvement of tubes and ovaries is so frequent an accompaniment of metritis that it is necessary in all cases, by careful bimanual examination and questioning of the patient, to determine just how much of the symptoms are to be attributed to the primary lesions and how much to secondary disturbances. A chronic salpingitis, or pyosalpinx, with adhesions, will frequently keep up a persistent metrorrhagia which will baffle all forms of local treatment and which will be cured only by the removal of the offending appendages.

So close are the sympathetic relationships between the uterus and distant organs, and so frequently are the symptoms of uterine disease manifested by remote disturbances, that the examination of no woman with any obscure chronic disease should be regarded as complete until the uterus and its appendages have been systematically and intelligently interrogated.

PROPHYLAXIS. Since most cases of metritis are the result of puerperal infection, the complete cleansing of the uterine cavity, whether after labor at full term or abortion, cannot be too strongly insisted upon. Unless, however, the practitioner understands the details of aseptic technique he will likely do more harm than good in attempting this cleansing. To leave a bit of membrane or placenta to the efforts of nature for its expulsion is doubtless safer than to trust its removal to a bungling tyro. If, on examining the placental structures, whether delivery be at full term or premature, the physician is in doubt as to the complete emptying of the uterus, he should, after thoroughly cleansing his hands and the genital passages, carefully explore the cavity and remove with the finger or curette, preferably the former, any remains that may be found. Flushing out the cavity after thus exploring it with a weak solution of bi-chloride (1-3,000) is



doubtless many times an unnecessary precaution, but it is one which will do no harm and may accomplish much good.

While the use of the curette with all aseptic precautions may sometimes be necessary for the removal of retained secundines, the use of the finger for this purpose is, in the vast majority of cases, safer and very much more satisfactory. The operation is not ordinarily made in these cases until evidences of infection are present. Under these circumstances, to open up a large, fresh, absorbing surface by the curette, in the presence of septic material, is exceedingly unwise. The trained finger of an intelligent physician almost invariably removes the retained mass, and that without infection or the slightest injury to surrounding healthy tissue. Under an anesthetic the finger can usually be introduced into the uterus in these cases without great difficulty, but if necessary the dilator may be employed to open the way for its entrance.

It cannot be too strongly impressed that curetting is a distinct and grave surgical operation; yet many physicians attempt to perform it in a hap-hazard way, without an anesthetic, without previous dilatation, without any but the crudest attempts at antiseptics, or even in their own offices. It is such gross carelessness as this that furnishes gynecologists a large part of their work.

TREATMENT. Up to about twenty years ago the work of the gynecological specialist, in addition to an occasional ovariectomy, plastic operations on the vagina, perineum or cervix, and the invention and application of multitudinous pessaries, consisted almost entirely in what was known as "local treatment" of his patients. By local treatment was meant applications to the vault of the vagina, the cervix, and endometrium of such medicaments as Churchill's Tincture of Iodine, Battey's Iodized Phenol, nitrate of silver, and occasionally the hot iron. At the present time, however, the infinite majority of intelligent gynecologists have entirely abandoned all these forms of "local treatment," the nearest approach to anything of the sort employed by most of them being hot water douches and the application of tampons saturated with glycerine, boro-glyceride, ichthyol, or



some similar agent. Cases not relieved by these methods are subjected to thorough dilatation, curettage and swabbing with some strong antiseptic, and then drained, either with gauze or the Outerbridge dilator. If these methods fail, as they frequently will in the marked chronic form of the disease, and if the symptoms are still so pronounced as to call for relief, removal of the cervix or appendages is next resorted to, or of the womb itself, either by abdominal section or through the vagina.

Probably the most common cause assigned for the use of these local treatments was "ulceration of the womb." We now know that so-called ulceration is, in a vast majority of cases, due to laceration of the cervix and consequent rolling out of the lacerated surfaces, together with the enlarged Nabothian follicles and thickened mucous membrane. Stimulating applications to such a surface will produce temporary benefit, and will perhaps even cause the surface to apparently heal over; but on cessation of treatment, the diseased condition promptly returns to its original state, and the patient has been in no way benefited. Or if the surface remains scarred-over, the source of irritation remains, and the liability to resulting malignant degeneration. True ulceration of the cervix doubtless exists, but it is either syphilitic, tubercular or cancerous in character. If syphilitic, local treatment is not necessary; if tubercular or cancerous, surgical procedures should be promptly instituted.

The next most common cause for local treatment was endometritis. There is no other disease which may be so well compared with endometritis as chronic nasal catarrh; and certainly those physicians who have made a specialty of diseases of the nose have found caustics of very little avail in the treatment of these chronic conditions. They resort quite promptly to the use of saw and chisel to straighten a deflected septum, and to these instruments or the curette, or sometimes the galvanic cautery, to remove diseased membrane or the hypertrophied turbinates. Drainage here, as in endometritis, is one of the most important considerations.



For cases presenting exudates in the pelvic connective tissue and thickening of the pelvic peritoneum, hot water and pressure by tampons will sometimes bring about rapid absorption and effect a cure. The exudates which thus yield are most frequently those which are the result of post-partum inflammation. When they are the result of specific infection, these local measures will accomplish little if any good. Painting the vault of the vagina in such cases with tincture of iodine or iodized phenol I have never found a benefit. (Indeed, I have never been able to attribute much benefit to the local application of iodine to any part of the body. I know it is used widely to produce absorption of effused fluids and exudates, but I must confess that I have never seen a case in which I could attribute any especially beneficial results to such applications.)

This chapter would be very incomplete did it not contain some warning as to the dangers necessarily inherent to such tinkering. Price, Goodell, Emmet and others have called attention to these dangers in very positive language. Some of the most complicated cases which finally reach the gynecological surgeon are those whose history indicates much local tinkering and repeated attacks of more or less severe pelvic peritonitis resulting therefrom. The cotton-wrapped applicator, saturated with some powerful germicide fluid, may carry, probably does, with its bane its own antidote; but less powerful applications, and especially the death-dealing sound, afford no such protection. While I have frequently found practitioners who claim to dilate and even curette the uterus in their offices, I know of no experienced gynecologist who does not perform those operations under full anesthesia, and with as thorough aseptic precautions as he does his abdominal sections.

Nowhere more than in pelvic disturbances does the practitioner need to feel the importance of recognizing the constitutional origin of many local diseases. Many complications of pelvic disorders will be found to be due to local congestion, which in turn will be dependent upon a weak heart, or obstructed



portal circulation, or to simple lack of bodily exercise. Neuralgia is said to be the cry of the nerves for better blood, and malnutrition and anemia will be found, in many cases, to be at the foundation of pelvic complaints, associated with manifestations of hysteria and neurasthenia; and in many of these cases local treatment, by simply keeping the mind of the patient directed to the pelvic organs, greatly retards or even prevents a cure.

**SPECIAL TREATMENT.** In acute metritis absolute rest in bed is of prime importance. Hot water douches should be given twice daily, and the bowels should be kept open by mild purgatives. If the pain is severe this is best relieved by an opium and belladonna suppository (opium 1 grain, extract of belladonna  $\frac{1}{4}$  grain).

In using the hot water douches certain precautions should be observed and the patient should be specifically directed as to these details, or the treatment will accomplish but little. The water should have a temperature of  $110^{\circ}$ - $115^{\circ}$ , and the nozzle should be of jettine or hard rubber, as the metal nozzle cannot be borne with water at that temperature. The temperature should be determined by the use of a thermometer and not guessed at, as otherwise it will almost certainly be too hot or too cold. The amount injected should be not less than two quarts: double this amount is much better. The douche having been gotten ready, the patient should lie across the bed with her hips brought to the edge, the head and shoulders being supported by pillows and the feet resting upon a chair. A piece of oil cloth, or rubber sheeting, the size of an ordinary towel, should be placed under the hips, so as to protect the bed, the lower end being gathered into a slop jar. The vulva and perineum should be protected by a little vaseline, which obviates the disagreeable sensation of the hot water. The nozzle should then be carefully introduced and the stream allowed to flow. With the fingers or a napkin the vulva should be lightly pressed against the nozzle, so as to distend the vagina with the hot water. By alternately intermitting this pressure the vagina is thoroughly cleansed and the heat more thoroughly



brought in contact with the pelvic viscera. The mechanical effect of the lifting up of the pelvic organs is also desirable. After the water has ceased to flow, and before withdrawing the nozzle, the latter should be depressed against the perineum so as to allow all the water to escape. A cotton tampon with the upper end saturated with glycerine should then be introduced and pressed against the cervix. Owing to the affinity of the glycerine for water there occurs a marked flow of serum, thus depleting the engorged cervix.

If the inflammation is marked by unusual engorgement, local blood-letting will afford great relief. This is secured by scarifying the cervix freely with a scalpel, the blade of which is so protected by wrapping in gauze as to leave only the point exposed.

In cases of acute gonorrheal metritis, or in cases in which there is a profuse discharge which is more or less retained by the contracted or swollen cervix, the canal should be dilated with a steel dilator, the fundus irrigated with an antiseptic, and drainage

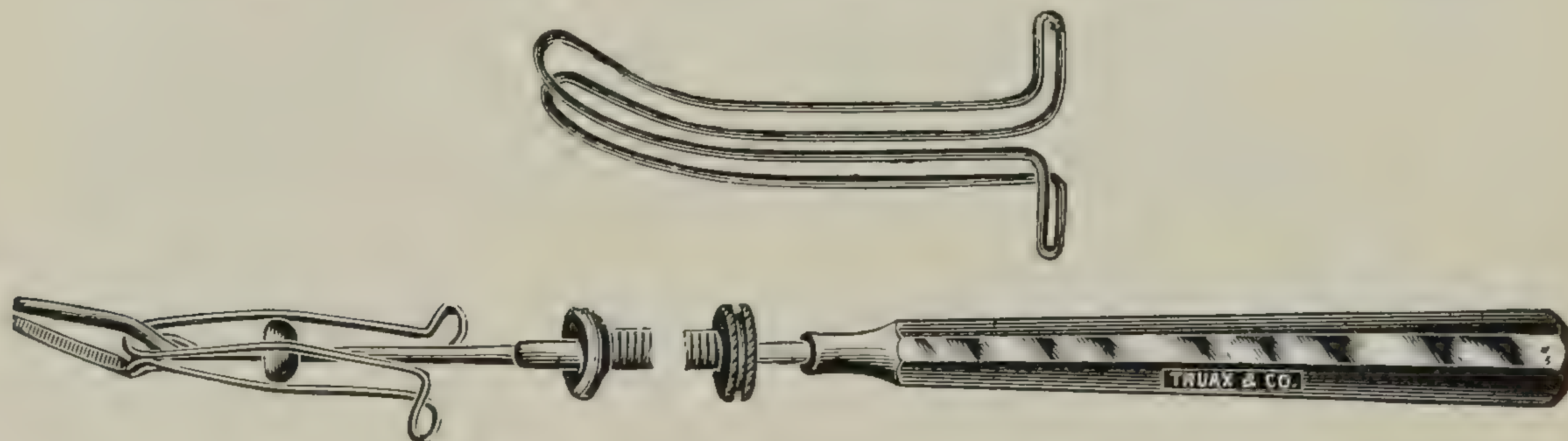


FIG. 56. Outerbridge dilator and introducer.

maintained by the use of the Outerbridge dilator (Fig. 56). This little appliance is easily introduced and retained, and if properly handled gives very satisfactory results. In gonorrheal metritis the repetition of the washing out will probably be needed for several days, or until the acute symptoms subside. With the Outerbridge dilator *in situ*, a long delicate nozzle can be easily and safely introduced and the antiseptic solution allowed to enter and wash out the infection with perfect safety, as there is ample room around the nozzle for the escape of the outgoing current.

In chronic metritis, and in some cases in the later stages of



the acute form, it is necessary to remove the thickened and infected mucous membrane. To accomplish this, cervical dilatation will be necessary in most cases, but not in all. The canal should be of such size as to easily permit the passage of the cu-

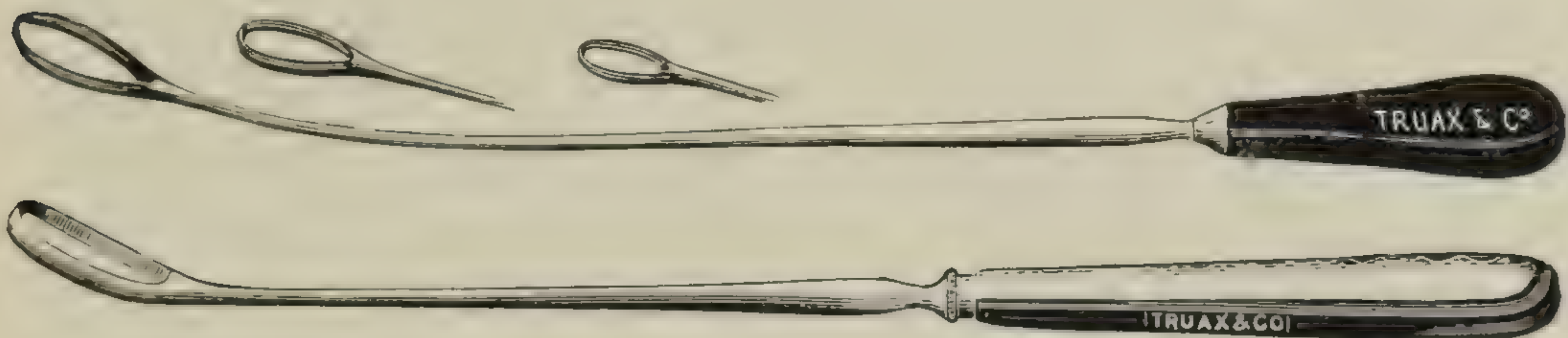


FIG. 57. Various forms of curettes.

rette (Fig. 57). The curette selected should not be a dull wire, such as would answer to ensnare and remove pieces of retained placenta, nor yet should it be so sharp as to endanger penetration of the uterine wall. It should, however, be sharp enough to penetrate and thus remove the mucous membrane. The entire surface should be gone over systematically, especially the fundus and the tissues in each horn. After completing the curetting the debris should be washed out with sterilized water, introduced through a slender cannula, until it comes away clear. A curette is in the market that has a perforation extending through the handle up to the end of the cutting surface, its design being to

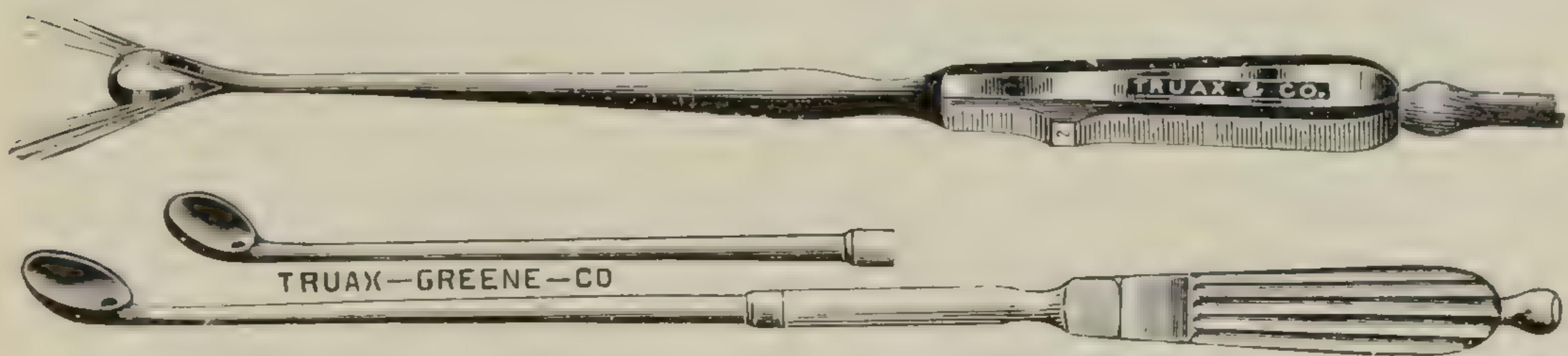


FIG. 58. Curettes for continuous irrigation.

permit of continuous irrigation. This form (Fig. 58) possesses some advantages, but the instrument is not so easily kept clean. After cleansing and drying the cavity with a bit of gauze introduced on an applicator, the entire endometrium should be wiped with some caustic solution, so as to complete the work of the curette. One of the best of these is undoubtedly Battey's Iodized Phenol. This can be introduced by means of an appli-



cator, or with a small syringe having a long nozzle: in the latter event care should be taken that the excess of fluid does not touch the vaginal walls.

It should be understood that the use of the curette in this way does not remove the entire thickness of the mucous membrane. The deeper portions of the glandular structure remain and rapid reproduction ensues. This removal and reproduction of the mucous membrane is very similar to that which takes place at each menstrual epoch, with the difference that, following the surgical procedure, the newly formed membrane will be found nearly or quite free from the bacteria which permeated the old.

Before using the curette the vagina should be thoroughly cleansed and the cervix exposed by perineal and, if necessary, lateral retractors held by assistants. The anterior lip is then seized with the bullet forceps or volsellum and the uterus drawn down as far as necessary and held by an assistant, while the operator proceeds to dilate and curette. If there is much debris, this should be withdrawn from time to time, so as not to interfere with the use of the instrument. It is sometimes well to use a fairly large instrument for the main portion of the surface and then to take a smaller one to reach the tissues about the Fallopian tubes. That no strips of tissue may escape, the entire surface should be gone over a second time. After everything is in readiness the operation should not take more than two or three minutes for its completion. Before withdrawing the retractors the upper portion of the vagina should be lightly filled in with strips of iodoform gauze, so as to prevent reinfection of the denuded surface. This gauze should be removed in about three days and subsequent asepsis maintained by means of weak antiseptic douches.

If a sufficient number of assistants are not at hand, the operation may be easily made with the aid of only an anesthetizer. In such a case the limbs are supported by leg-holders, or a sheet passed around the neck in front of one shoulder and behind the other, and then passed behind each knee and tied snugly, so as to approximate the knees to the chest. By using a self-retaining



perineal retractor (Figs. 30, 31) the operator can easily expose the cervix and perform the necessary manipulations unaided.

In the hemorrhagic form of metritis temporary relief may be afforded by the use of astringent vaginal tampons, introduced as is customary in cases of threatened abortion. The internal administration of ergot has been highly recommended, but I have found the use of the oil of cinnamon, usually in doses of twenty or thirty drops every three hours, much more effectual. In such cases curetting should be resorted to, and will usually be found curative. In cases, however, in which the hemorrhage still persists it will usually be found that this continuance is caused by the presence of a small sub-mucous fibroid, or of disease of the appendages, or malignant change involving some portion of the endometrium. In such a case hysterectomy, either abdominal or vaginal, should be made.

In the chronic painful hyperplasia of the uterus, which was the bane of the gynecologists a few years ago, much may be accomplished by repeated curettings, but many times even this will completely fail to effect a cure, or even to give anything but the most temporary relief. In such cases, if the disease seems to be marked in the cervix, this should be amputated. If, however, the entire body is involved, the appendages will also be almost invariably implicated and a cure can only be effected by removal, preferably as a rule through the vagina, of the entire offending mass. The mortality of this operation is small, while the relief afforded is so great that there should be no special hesitation in proposing it to the sufferer.

ACCIDENTS. Instances have been reported of perforation of the uterus by the curette. This certainly could only occur in connection with the use of an exceedingly sharp instrument, or from the exercise of undue force. The operator should always bear in mind that the recently pregnant uterus is exceedingly friable, and that much less force can be safely used than in the non-puerperal condition. If such an accident should occur, its prompt recognition and immediate cessation from further pro-



cedures would probably be followed by no ill results. In case, however, of extensive laceration, and in the midst of septic conditions, an immediate abdominal section with cleaning of the peritoneum, with or without hysterectomy, would be indicated.

Hemorrhage need never be feared. If the condition of the patient is such as to cause the operator to dread even slight hemorrhage, the use of the hollow curette with hot water would probably obviate the danger, while prompt packing of the cavity with a strip of gauze would prevent any post-operative hemorrhage.

The cervix has occasionally been ruptured from the use of the steel dilator, this accident being the result either of unusual friability of the parts or unnecessary violence in dilating. The laceration usually takes place into the broad ligament. Under treatment on ordinary aseptic principles, healing will take place and no harm result from such an injury.



## CHAPTER XIII.

### ABDOMINAL OPERATIONS.

A FEW words are necessary at this point which will apply to all the operations in which the abdominal cavity is opened. In addition to the general aseptic preparation of the patient, she should have been thoroughly purged by medicines given at least thirty-six hours before the operation. If the operation is to be made on the third day, the patient should on the first day have only light diet but should be given plenty of fluids to drink. On the evening of the first day three to five grains of calomel should be given. On the morning of the second day, unless the calomel is acting freely, two teaspoonfuls of Rochelle or epsom salts, or a Seidlitz powder, should be given every hour until thorough evacuation is procured. In order to avoid the depressing effects of the purgatives, and at the same time to prepare the patient's heart and nerve centers for the anesthetic, strychnia should be commenced on the morning of the first day and continued until the morning of the operation. One-thirtieth of a grain should be given every three hours, or if the patient is unusually large one-twentieth of a grain should be given at the same intervals. Only liquid diet should be given on the second day. If the patient is inclined to be nervous and restless, fifteen or twenty grains of sulphonal or trional should be given on the evening of the second day in order to procure sleep. No food should be given on the morning of the third day, although if the operation is not to take place until a moderately late hour of the forenoon a cup of hot tea or coffee may be given early, but nothing should enter the stomach for at least three hours before the giving of the anesthetic.

The room in which the operation is to be performed should be heated to about 85 or 90 degrees Fahr. The air should preferably be moistened by the introduction of steam. This heated and



saturated atmosphere is not so pleasant for the operator to work in, but it is much better for the exposed peritoneum of the patient. The arrangement of the room and the operating table is shown in

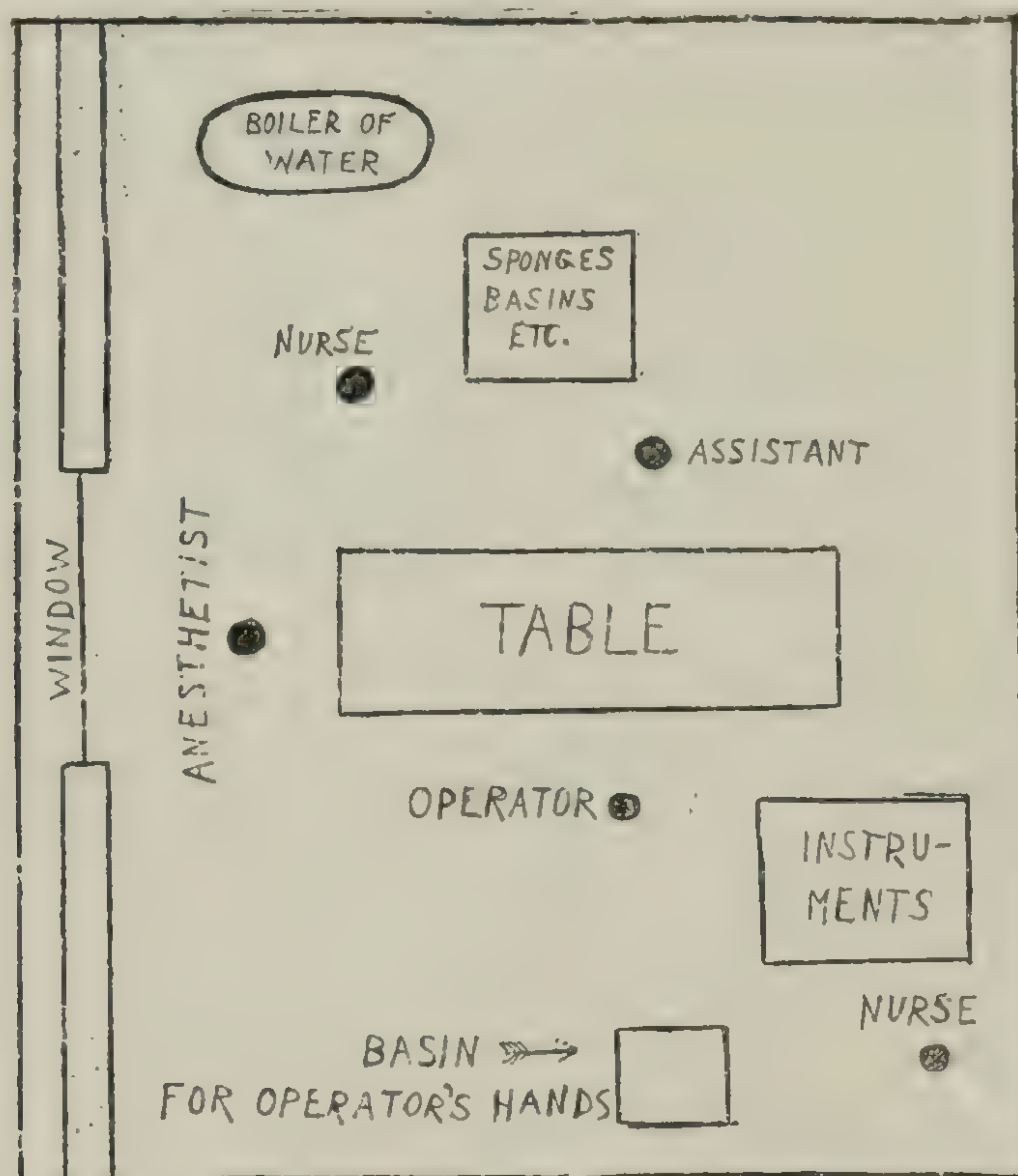


FIG. 59. Diagram of room arranged for an abdominal section.

the accompanying diagram (Fig. 59), but each operator usually arranges according to his individual tastes.

When all possible sources of infection can be avoided, deaths following abdominal operations so rarely occur that at the present time an expert operator will advise, or indeed urge, operations for the relief of many conditions which are attended by suffering only but in which life itself is not in danger. If the patient's sufferings are great, if her life is rendered of comparatively little value to herself or family, she can well afford to undergo the risk involved by an operation conducted in accordance with modern methods. But if the surgeon is in doubt as to his ability to secure the degree of asepsis required by these methods, no such advice can conscientiously be given. It is because these conditions can be best secured in the modern hospital operating room



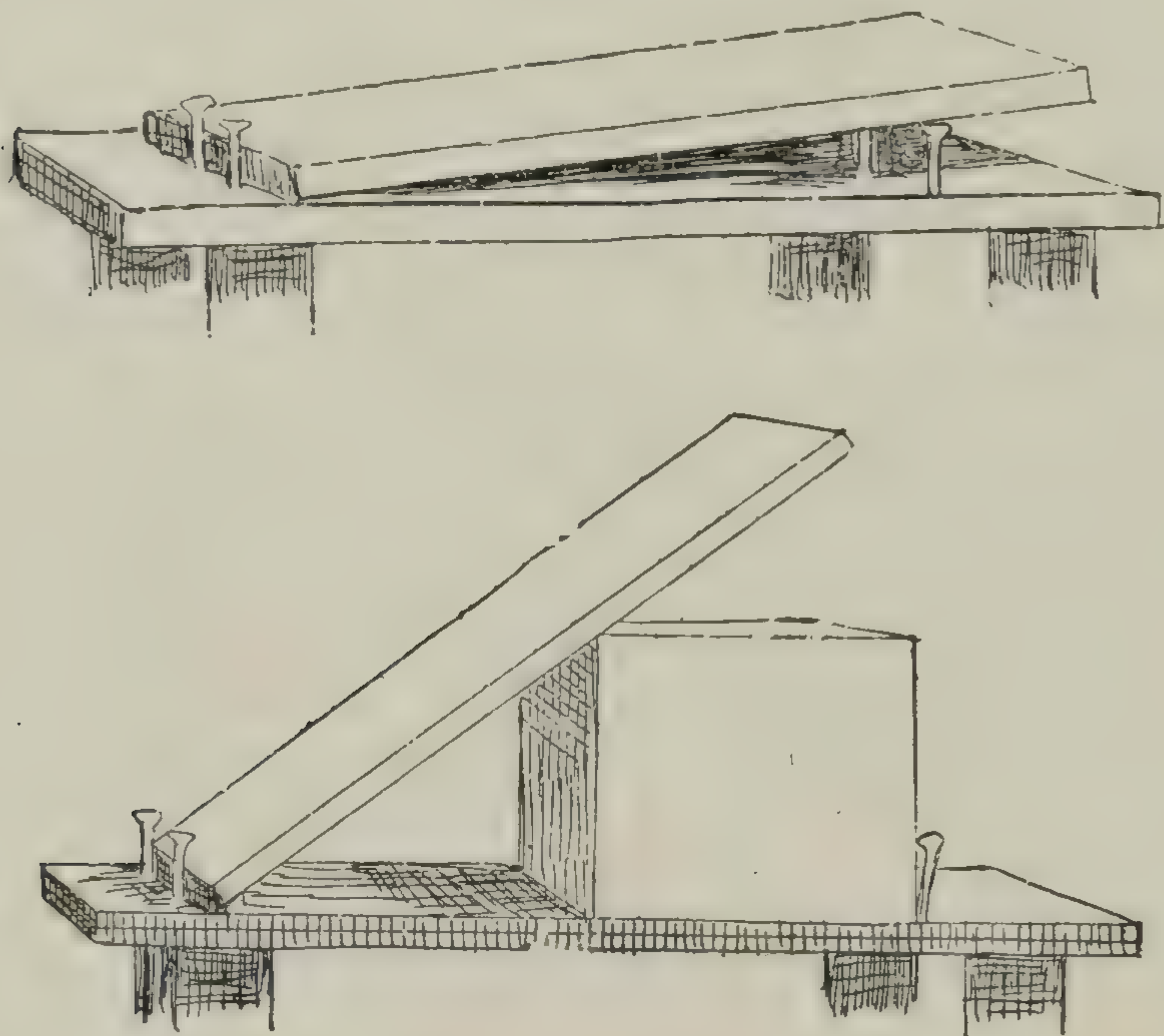
that many operations are undertaken there which would be declined or advised against if required to be done in a private house. The operating room has better light, better appliances, better and more numerous assistants, and, above all, better asepsis. Most surgeons feel that the inherent risk of any operation is about doubled if performed in a private house. In nearly all gynecological operations there is ample opportunity for deliberation and choice of location, and almost invariably the patient can be transported without risk to some point where suitable hospital facilities can be obtained.

While in cases of emergency, such as internal hemorrhage, intestinal perforation, visceral rupture, or Cesarean section, immediate operation may be necessary, and while under such circumstances it may be impossible to secure proper surroundings or even an experienced operator, while in other words the best must be done which the circumstances will permit, under ordinary conditions, owing to the technical skill required and the frequency with which unexpected complications arise, these operations should be undertaken only by surgeons who have had experience or opportunities for extended observation, or who are so situated as to be called upon to do such operations at frequent intervals.

It has come to be quite the fad with ambitious young physicians to pose as abdominal surgeons. A few recoveries in simple cases not only lead such young men to have a false estimate of their own abilities, but lead the people as well to impose in them an amount of confidence that is ill-deserved. Not long delayed, however, will be the more difficult and complicated cases in which the would-be surgeon will meet his Waterloo. It is quite incomprehensible why a young physician who would not for a moment think of operating on a cataract, in which every step of the operation and every possible complication can be anticipated, will undertake the removal of an abdominal growth the nature of which and the complications which may attend its proposed removal he can only dimly surmise.



**THE TABLE.** Some form of specially made operating table is much more convenient for the operator than any table which can be extemporized, but many times such a special table is not at hand and then an ordinary kitchen table must be substituted. The chief objection to the extemporized table is that it is too low, too wide, and is not well adapted to securing the Trendelenburg position: the latter, however, can be secured by introducing into the top of the table four nails at proper intervals so as to sup-



**FIGS. 60 and 61.** Ordinary table arranged with board for securing the Trendelenburg position. In Fig. 61, the box is shown in place. The board should have a width of about 14-16 inches and a length of about 30 inches. An extra assistant should be at hand to lift up the board and introduce the box. The size of the box is not material, as the nails can be so placed as to secure the desired elevation of the board with any box which may be convenient.

port a board, as shown in the accompanying diagrams (Fig. 60-61). Such an arrangement can be provided by the surgeon himself in a very few minutes and makes an excellent substitute for the surgical table.

**THE INCISION.** Other things being equal, the shorter the incision the better. A short incision requires fewer stitches and is less likely to yield to a hernial protrusion than a long one.



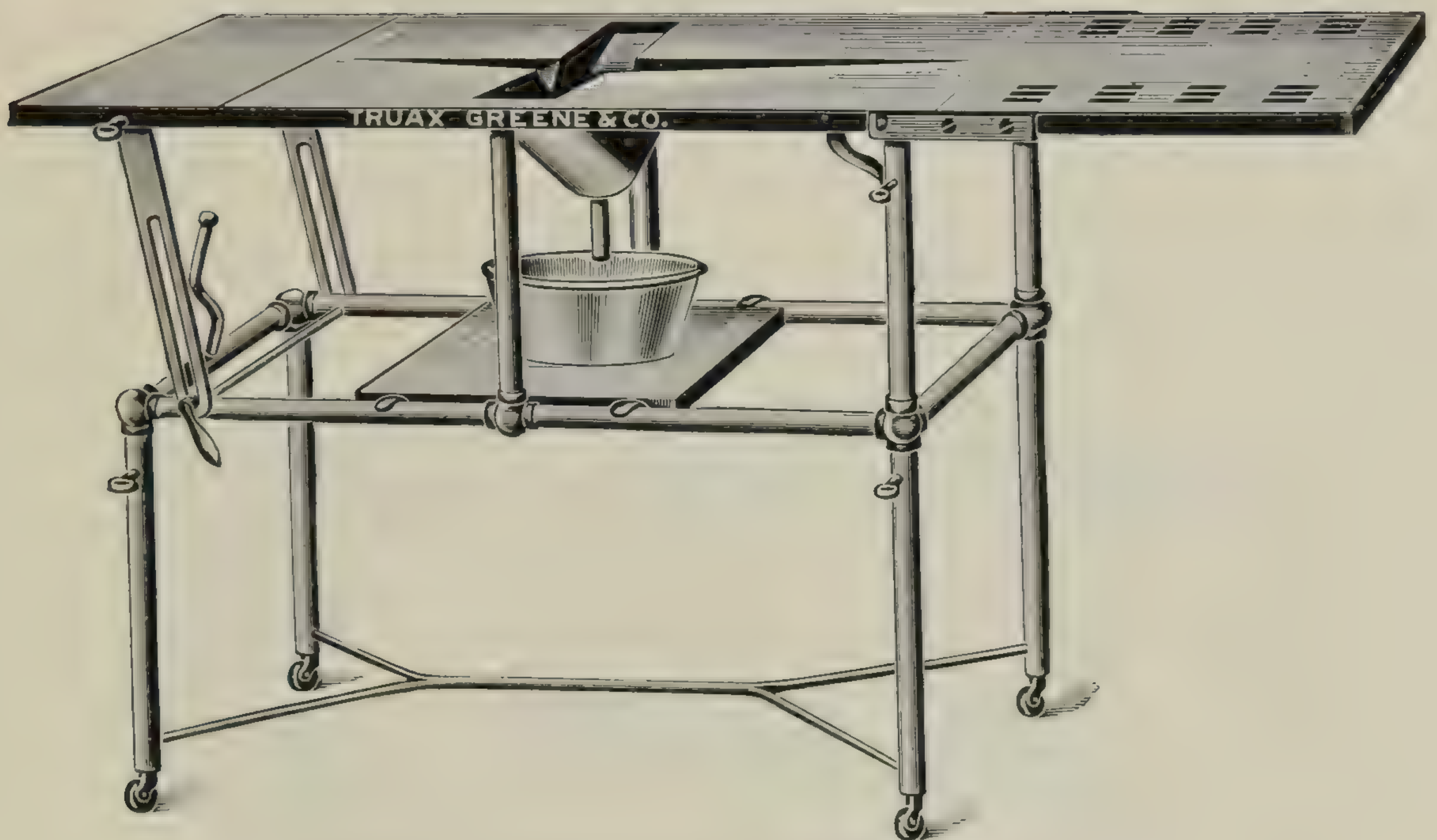


FIG. 62. Author's table in the horizontal position.



FIG. 63. The same in the Trendelenburg position. The flap supporting the head can be let down, if desired, so that the head will be in a line with the trunk.



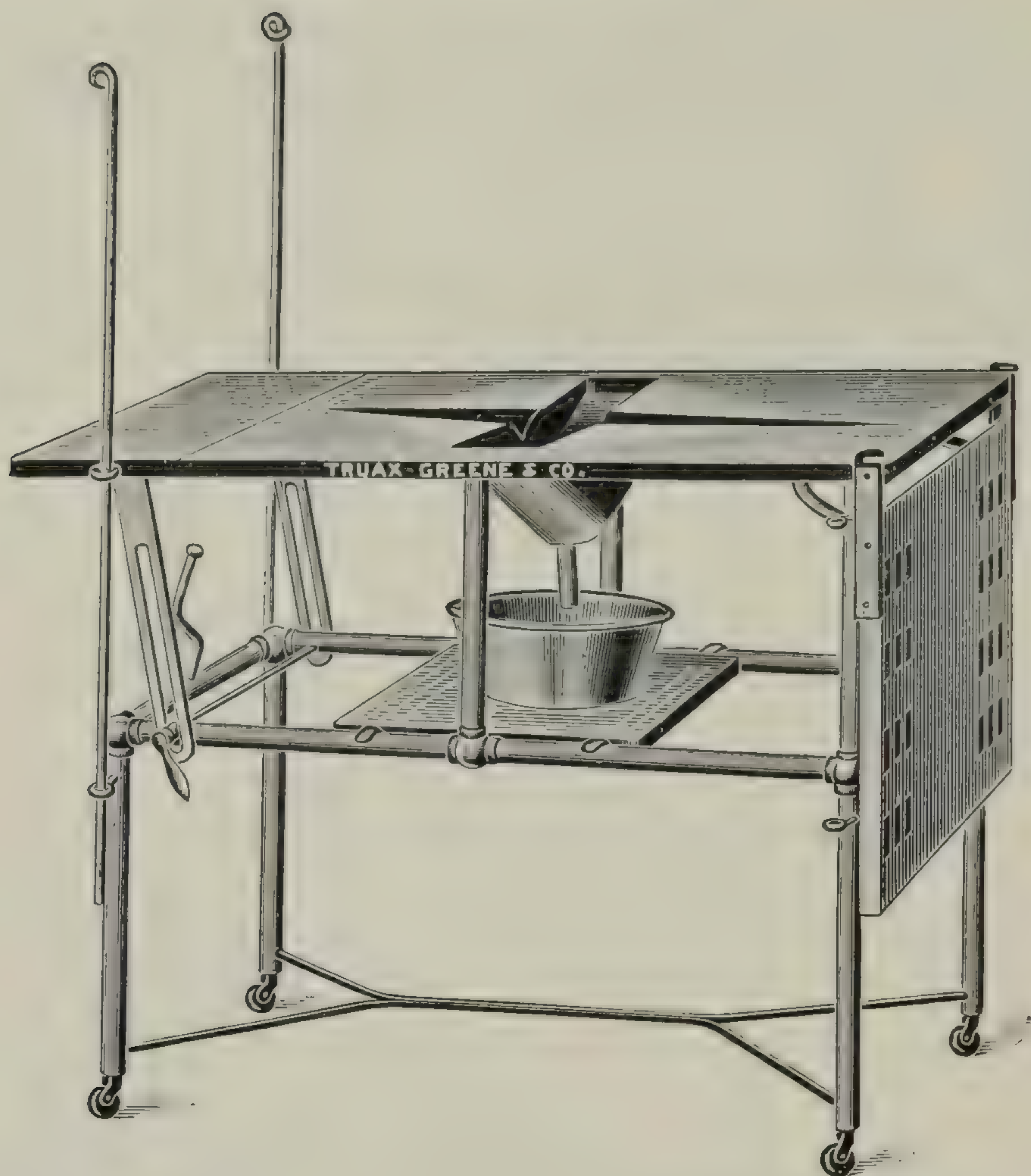


FIG. 64. The same in position for perineal work, with leg supports in place.

Nevertheless, the operator should not permit himself to be hampered in his work by too short an incision. If a short incision will cause the loss of much time in the operation, it better be extended. While the incision should be practically in the median line, as at this point there is less liability to hemorrhage, it is not necessary that it should exactly strike the linea alba; indeed, many operators prefer to make the incision a little to one side so as to go through the edge of a rectus muscle. The first incision should usually reach to the muscular aponeurosis. If a blood vessel spurts it should be seized by the assistant with a hemostatic forceps, care being taken not to include the skin. No attempt should be made to check the oozing before proceeding further



with the incision, but all bleeding vessels of any importance should be seized. Blood is too valuable to be needlessly lost. Hemorrhage being controlled, the sheath of the muscle is opened or the linea alba split. The incision having passed through the linea alba, or through the rectus and its sheath, the sub-peritoneal layer of fat is reached. This is sometimes quite thick. The operator seizes this fat with the forceps at one side of his incision, and his assistant with another forceps seizes it just opposite. The portion between the forceps is now brought up and incised. Sometimes the peritoneum is intimately connected with this fat and the same incision penetrates to the peritoneal cavity. Usually, however, the peritoneum will be found intact after the layer of fat is separated from the line of incision. In this case the peritoneum is caught up with a double pair of forceps, as before, and carefully incised between them. As the incision penetrates the peritoneum, air at once enters and the intestines fall away so that the operator can enlarge the incision with safety with his knife, or if he prefers with scissors guarded by the finger introduced into the abdominal cavity. If from the history of the case adhesions are anticipated, great care is to be exercised in opening the deeper portion of the abdominal wall. An adherent loop of intestine may be very easily incised if the operator is not on his guard. Sometimes the bladder is drawn up under the line of incision and may easily be opened by a careless surgeon. An inexperienced operator may find the use of a grooved director of advantage, though with increase of experience that instrument will be quickly abandoned. The abdomen having been opened the surgeon should rinse his hands and then introduce one or two fingers into the abdominal cavity to determine the relationships of the parts and the pathological conditions present. The incision may now be enlarged if found desirable. Two fingers being introduced into the opening the incision can be rapidly extended in either direction by the knife cutting down between the fingers. The knife is to be preferred to the scissors ordinarily, as it does not bruise the tissues. It is at this stage usually that gauze sponges



should be introduced to protect the exposed intestines from the air and also to guard against contamination of the general abdominal cavity by any septic material which may be set free by subsequent manipulations.

**CLOSURE OF THE WOUND.** The abdominal work having been completed the cavity should be thoroughly cleansed of all blood or other fluid. As the sponges are removed they should be carefully counted and this count must agree with that made before the beginning of the operation. The surgeon and the nurse should be positive as to the original number of sponges, and the abdomen should not be closed until every sponge is accounted for. Carelessness in this respect has resulted in many deaths, only a small number of which, for manifest reasons, have

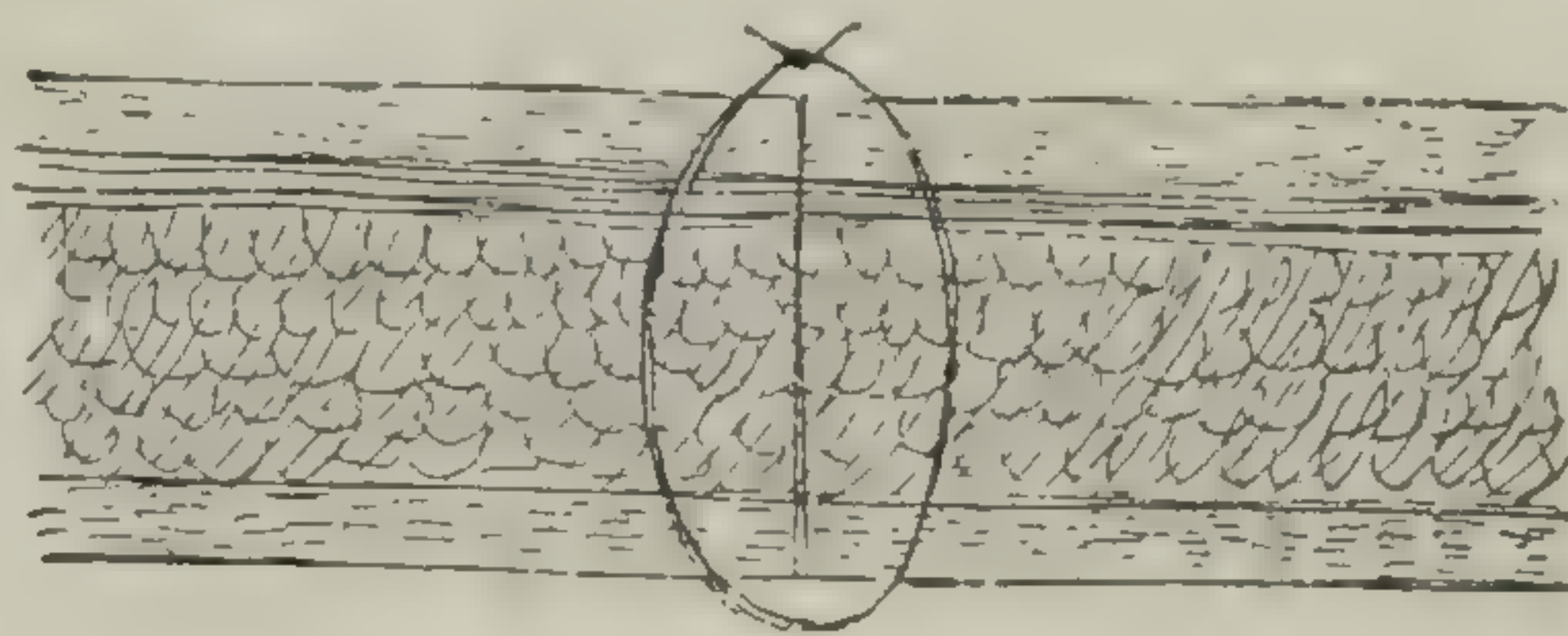


FIG. 65. Showing proper introduction of stitch to close the abdominal wound.  
The cut shows the suture tied.

ever been made public. Some operators still use in the abdominal cavity small hemostatic forceps. If such are used they should be carefully counted before commencing the operation, and again before closing the abdomen. It is safer, however, to use only such long forceps that their retention in the abdominal cavity would be impossible. The cavity being cleaned and all sponges and instruments accounted for, the omentum should be drawn down so as to cover the intestines in the natural way. A clean gauze sponge should now be laid under the wound so as to catch any blood which may result from the introduction of the sutures.

Various methods have been devised for closing the incision. The method about to be described is that which, after the use of many others, the writer has finally selected as the best. A handled needle with a little projecting hook on the under surface (Fig. 5) is introduced through the skin a quarter of an inch from



the margin of the wound. It is carried outward and swept through such a curve as to embrace in its course an ample amount of subcutaneous fat, fascia and muscle, but only a little of the edge of the peritoneum (Fig. 65). If the abdominal walls are quite thick it will be necessary to introduce one end of the silk worm gut before transfixing the opposite wall. If, however, the parieties are not too thick the needle is advanced catching the edge of the peritoneum, transfixing with a good sweep the muscle, fascia and subcutaneous fat, and being brought out at a point just opposite and corresponding to that of its introduction. Whether the sutures shall be introduced, therefore, by two punctures of the

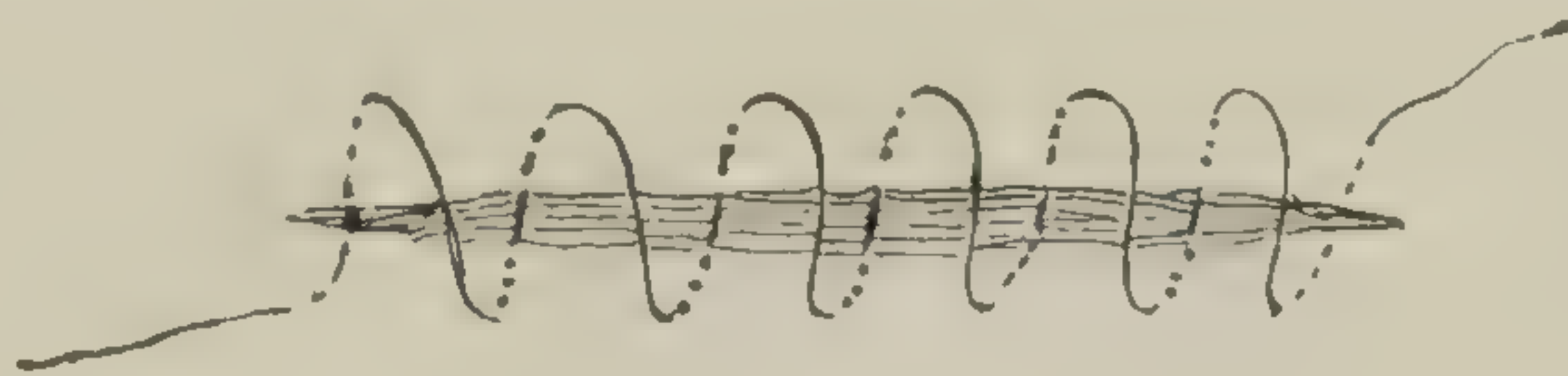


FIG. 66. Showing method of introducing silver wire to draw fascia together.

needle or by a single one transfixing the walls on both sides, will depend upon the condition of the parts. Most frequently the stitches nearest the ends of the incision will have to be introduced in two steps; the others by a single transfixion. The stitches should be introduced at intervals of about one-third of an inch. If the abdominal walls are greatly relaxed, as after the removal of a large tumor, the stitches need not be quite as close together as they should be if there is likely to be any special tension upon them. The sutures having been all introduced the ends are gathered together upon each side and fastened with a forceps. The gauze sponge is now withdrawn, and if he feels any doubt as to his hemostasis the operator may quickly explore the pelvis to ascertain whether there is any bleeding. The sutures are then pulled up on each side, so that the deeper portion of the incision is brought well into apposition. With a good sized needle of full curve, threaded with a loop of silk about one foot long, the operator proceeds to close the fascia, as it is upon this membrane that chief reliance must be placed for the avoidance of hernia.



The needle is entered so as to catch up about one-quarter to one-third of an inch of the fascia on one side. It is carried across the incision and brought out through the fascia upon the opposite side and a little higher up than the point of entrance (Fig 66-



FIG. 67. The silver wire drawn tight, bringing the fascia into apposition. The wire thus becomes practically straight so that its withdrawal is easy.

67). The loop is drawn nearly through, and the process is repeated until the fascia has been lightly closed by a continuous suture. The loop of silk should at no point be drawn tight. By means of the loop, a silver wire is now drawn in until the wire takes the place of the loop. The needle is then passed out above the upper end of the incision so that it makes its exit through the skin about one inch above the cut. A handled needle, or a needle with the eye near the point, is now introduced through the skin about one inch below the lower end of the incision, and the lower end of the silver wire caught and withdrawn. The silver wire now appears as a rather loose coil in the wound. It is next seized at each end and drawn taut. It should be pulled back and forth until it is evident that there are no kinks in the wire and until it becomes practically straight, the line of incision in the fascia being thrown into slight curves as the wire is straightened. Each end of the wire is now passed through a pad of iodoform gauze and fixed by means of a perforated shot, the excess of wire being cut off. By this maneuver the fascia is brought into perfect and snug apposition with no possibility of a bit of muscle or fat getting between the edges. The silk worm gut sutures are now tied, and if necessary additional sutures of silk-worm or catgut are introduced to bring the edges of the skin into perfect apposition.

When the operator has at hand kangaroo tendon or catgut, of whose strength and absolute sterility he is positively certain, the use of this material for closing the incision is undoubtedly absolutely ideal. The peritoneum is first closed with a running



thread. The muscle is then approximated in a similar way, then the fascia, and then the skin by the subcuticular stitch. (See Fig. 8.) If there is much superficial fat, this should be brought together by a separate suture. The surface being cleaned, the line of incision is covered with collodion and healing should be absolutely free from disturbance.

DRESSING. The abdomen having been cleansed the long ends of the silk-worm gut sutures are lifted up on each side and a strip of gauze, either plain or iodoform, placed upon each side as close to the edge of the incision as it can be pressed. The ends of the sutures are now brought down over these gauze strips and another piece of gauze made to cover these, and also the line of incision. This latter strip should be about three inches wide and the ends of the sutures projecting beyond should be cut off. Several thicknesses of gauze should now be applied, extending widely beyond the wound. Over the gauze should be applied several thicknesses of sterilized cotton, either absorbent or plain, and over all this a snug many-tailed bandage. The bandage should be fastened from below up, so that the first portion will be fastened sufficiently below the crest of the ilium to prevent its slipping up. In most cases it is well to place strips of adhesive plaster across the abdomen outside of the gauze dressings and before applying the cotton, so as to prevent the exposure of the wound in case the abdominal bandage should work out of place.

Unless there are clear indications for so doing, these dressings should not be disturbed until the tenth or twelfth day. On their removal the incision should be found healed throughout and ready for the removal of the sutures. In removing the sutures the skin should be moistened with a rather strong solution of bichloride, 1-200 not being too strong. This should be allowed to remain for a few moments so as to work into the skin at the points where it is penetrated by the sutures. The ends of each suture should then be drawn upon from one side and the suture cut by pressing the points of the scissors well down into the skin



so as, if possible, to cut the suture at a point where it has been entirely buried. It is wisest to cut all the sutures before withdrawing any, as the patient will be less nervous and will bear the pain better. It is sometimes wise to allow the silver wire to remain two or three days longer, but it can usually be removed at the same time with the other sutures. One end of the wire is drawn upon by seizing the pledget of gauze below the shot and a little of the bichloride solution applied at the point of entrance. The wire is then cut as close to the skin as possible and withdrawn by traction upon the other end. As the wire is practically straight its withdrawal is effected without the slightest difficulty. The surface having been cleansed, fresh dressings are applied and the wound need be subjected to no further exposure until the patient is practically ready to leave the hospital. If, however, for any reason some infection of the wound has taken place so that a stitch abscess results, the presence of which is usually indicated by more or less pain in the line of incision, with increase of the pulse and sometimes a sharp rise of temperature accompanied by a rigor, the dressings should be at once examined and such of the sutures as pass through the infected region carefully removed. The presence of such an abscess will prevent union by first intention, but it need not interfere with the integrity of the wound, as the silver wire may be allowed to remain. If an abscess has formed it will be necessary to dress the wound daily, sometimes two or three times a day, until healing takes place.

**IRRIGATION.** By irrigation is meant the flushing out of the abdominal cavity by the introduction of water, or normal solution (which is made by adding a teaspoonful of sterilized salt to a quart of sterilized water), by pouring the same into the cavity from pitchers or by means of a funnel and tube carrying the fluid to the deepest parts of the cavity. Irrigation should be used only in cases in which pus, feces, or other septic material has been carried extensively throughout the cavity. If such septic infection is limited it should be removed by careful wiping with gauze sponges, but without flushing. If, however, the sepsis is wide-



spread, then flushing should be resorted to. The fluid used should be hot as the hand can bear, and should be used with the utmost freedom. The whole arm should be introduced into the cavity and the intestines and other viscera thoroughly washed. It may be necessary even to bring the intestines out of the cavity so that they may be more freely washed and rinsed. The fluid should be introduced until it comes from the deepest recesses perfectly free from evidences of contamination. The fluid remaining in the cavity should then be sponged out, the toilet of the peritoneum completed and the incision closed. Such flushing is done only as a dire necessity and as a desperate attempt to obviate general infection. Such flushing tends to denude the peritoneum of its epithelium and to thus render it very liable to form adhesions, but of the two evils liability to adhesions is the less and the flushing must therefore be resorted to.

ACCIDENTS. Internal hemorrhage is that which the operator most dreads. It usually comes on within a few hours after the operation. The hemorrhage sometimes commences immediately after the operation so that it becomes necessary to distinguish between the symptoms of shock and those of hemorrhage. Internal hemorrhage is most likely to occur in cases in which an important blood vessel, such as the ovarian or uterine artery, has been ligated *en masse*, and especially if there is any tension upon the tissues thus ligated, or if the projecting button of tissue has been cut off too short. In these cases the knot does not slip but a part of the tissue draws out from the hold of the ligature and the patency of the artery is restored. The ovarian artery is the one which is the most apt to give rise to this hemorrhage, and on this account it is prudent to apply to it an extra ligature by transfixing and ligating the upper border of the broad ligament through which the vessel passes. The application of this extra ligature takes but a moment and is a valuable precaution. The usual symptoms of internal hemorrhage are faintness, restlessness, cold sweats, feeble and frequent pulse, pallor of the face, cold extremities, and increased rapidity of respiration. If these symptoms



come on after an operation in which there has been no special hemorrhage or prolonged exposure of the peritoneal cavity, the diagnosis of internal hemorrhage may unhesitatingly be made and the abdomen should be at once re-opened and the bleeding point found and ligated. If, however, there has been much hemorrhage during the operation, or if the operator has failed to protect the intestines and abdomen by gauze sponges, the condition of the patient after being put to bed may very closely resemble the condition of a patient in whom hemorrhage is going on. This condition following the operation, technically known as shock, will gradually disappear under the influence of quiet and the external application of heat. If, however, the symptoms of shock do not yield but rather deepen, it is safest to assume that hemorrhage is in progress and a re-opening of a part of the incision is advisable. It is only necessary to remove a stitch or two, so as to work the point of a blunt forceps down through the line of incision. Internal hemorrhage will at once manifest itself through the opening thus made, but if a mistake has been made the opening can be quickly reclosed and no particular harm has been done.

INJURY TO BLADDER. The bladder is sometimes intimately adherent to fibroid and ovarian tumors, which as they rise out of the pelvis draw it up in front and in the direct line of incision. In some cases the bladder seems to be congenitally attached to the anterior abdominal wall above the pubes. Under such circumstances, and in spite of the utmost care, the viscus will sometimes be incised in making the abdominal incision. The mishap will be immediately recognized by the cautious operator, who will at once proceed to repair the mischief done. The bladder should then be carefully separated from its adhesions, and the line of incision approximated by a continuous catgut suture made to embrace the entire thickness of the bladder wall except the mucous membrane. If possible this line of suture should be brought up so as to be made extra-peritoneal in the final closure of the abdomen. A ventral suspension of the uterus will usually afford excellent support and protection to the line of suture, while a gauze drain is



easily introduced below and in front of the attached fundus so as to give an exit to the urine in case of leaking. At the completion of the operation a catheter should be introduced into the bladder and allowed to remain for several days, in order to permit satisfactory union of the wound.

**TORN BOWEL.** In all cases in which, in separating adhesions, laceration of the bowel seems imminent, an attempt should be made to save the bowel by removing a portion of the wall of the adherent tumor. The piece of membrane thus left attached can later have its edges approximated so as to cover any exposed raw surface (Fig. 71). In many cases, however, such precaution is impossible of execution, or the bowels may be matted together so that no tissue can be secured. Under such circumstances the separated bowel should be carefully examined at the very moment of separation. If it is then found that the peritoneal and muscular coats only have been torn through, these surfaces can be approximated by whipping the edges together with fine catgut. If the laceration has penetrated all the coats of the bowel, the mucous membranes should be united, preferably, by continuous catgut or fine silk. This line of stitches should then be pushed into the lumen of the gut and the muscular and peritoneal coats brought together by a continuous Lembert suture of fine silk or catgut. If it is found that this method of closure, owing to more or less destruction of tissue, will likely result in a stricture of the bowel at this point, excision of the bowel should be made at the point of injury and an end-to-end or lateral anastomosis made by the use of the Murphy button, or other appliance or method.

Many of these cases of bowel injury will tax to the utmost the skill and resources of the surgeon. Injuries of the rectum are sometimes especially difficult to reach and close. In one case in operating for the relief of a fecal ventral fistula, following an ovariectomy by another operator, the fistulous tract was found opening into the rectum. This portion of the bowel was so imbedded in exudate and the edges of the opening so friable that none of the usual methods of effecting a closure were available. In that case



I detached from the uterus the left broad ligament, and by using this as a patch easily closed the opening, the patient making a prompt recovery.

SEVERED URETER. In the removal of uterine fibroids, or other pelvic growths, by abdominal incision, it occasionally happens, in cases of abnormal development or of unusual adhesions, that the ureter is severed. Every care should be taken by the operator to avoid this accident, but if in spite of every precaution it takes place, an attempt should be made at once to repair the mischief. The simplest method of securing anastomosis is as follows: Close the end of the lower segment of the tube with fine silk or catgut. Just below this point make a longitudinal incision into the ureter and into this implant the end of the upper segment, fastening it in its new position by a few stitches of fine silk or catgut. As the point of union may possibly leak, there should be inserted a Mikulicz tamponade, or other form of satisfactory drain, so as to avoid disastrous results in case leaking should take place.

It will sometimes happen, however, that anastomosis is impossible, owing to the diseased condition of the ureter, the questionable location of the cut, or to the fact that a section has been excised in the operation. Under these circumstances it will sometimes be possible to implant the end of the ureter into the bladder itself, by making a small incision and uniting the two structures directly with fine silk.

In case neither anastomosis nor implantation is found feasible, the kidney on the side involved should be removed. The implantation of the ureter into the bowel is feasible theoretically, but secondary infection of the pelvis of the kidney soon results with death of the subject. The removal of one kidney, however, when the remaining kidney is healthy, seems to produce no special effect upon the organism.

INTESTINAL PARALYSIS. This is usually the result either of a too great exposure of the intestines during the operation, of infection and its resulting peritonitis, or of intestinal obstruction,



the result of adhesions of the intestines either to each other or to an exposed pedicle or denuded surface. Intestinal paralysis is indicated by increasing abdominal distension, an anxious expression of the patient's countenance, increased rapidity of the pulse, vomiting, and the absence of the passage of intestinal flatus. The ear applied over the abdomen fails to detect the gurgling which accompanies normal peristalsis. If the paralysis continues, the vomiting may become stercoraceous. It is frequently, indeed usually, impossible to distinguish between an uncomplicated intestinal paralysis and that which is the result of septic peritonitis or of intestinal obstruction. The character of the operation and its attendant circumstances will aid materially in arriving at a diagnosis. If the paralysis is uncomplicated, relief will be many times afforded by the hypodermic injection of strychnia (1-20 grain every three hours), and by the administration of cathartics. As vomiting has frequently already commenced it will not be easy to accomplish much by the use of cathartics. Nevertheless, calomel should be given in one-quarter grain doses every half hour. This should be taken dry upon the tongue and followed by the administration of a swallow of hot water. Even if the patient vomit soon after, most of the calomel will be mechanically retained. More or less relief of the tympany will be afforded by the use of enemata containing an ounce or two of sulphate of magnesia and an equal amount of glycerin, and two or three drachms of turpentine with about a pint of water. (It is sometimes advised that these injections should be given through what is called a colon tube. This tube should never be used. If rigid it is a source of great danger, as perforation of the bowel has been known to follow its use, while if the tube is flexible it will almost invariably simply curl up in the upper portion of the rectum and utterly fail of its purpose. I doubt very much if a colon tube can be made to pass through the sigmoid flexure.) Septic peritonitis, which is the most usual cause of intestinal paralysis, may be most frequently diagnosticated by the facies of the patient. This facies is indescribable, but once having been seen by an operator will sub-



sequently be recognized without much difficulty. This condition is sometimes accompanied by elevation of temperature, but not infrequently the temperature is normal or even sub-normal, so that little reliance can be placed upon this symptom. Post-operative septic peritonitis may be regarded as uniformly fatal, and treatment should be to secure euthanasia.

If the operator has reason to believe that the symptoms may be due to obstruction of the bowel, he should at once re-open the abdomen and search for the point of adhesion. Usually this will be found where the stump of a pedicle or a denuded surface has been left exposed. Prompt interference has saved many lives which would otherwise have been lost.

VOMITING is sometimes a most distressing symptom even if it does not indicate intestinal paralysis or peritonitis. It is frequently relieved by the administration of a few drachms of very hot tea or hot water. A few drops of a twenty-five per cent. solution of menthol in olive oil will sometimes prove efficient, or a drachm or two of chloroform-water or of a weak solution of cocaine. External applications of mustard over the pit of the stomach or a hot water bag will sometimes succeed when internal remedies fail. As the vomiting is usually relieved as soon as a movement of the bowels is obtained, an attempt should be made to secure downward peristalsis by rectal injections of salts and glycerin, or the same with turpentine. Stomach washing may be resorted to if all other means fail, but this remedy is an exceedingly disagreeable one.

AFTER-TREATMENT. As soon as the operation is completed the patient should be placed in a warmed bed and surrounded by hot-water bags or bottles. Great care should be taken that the water is not too hot, as otherwise the unconscious patient may be badly burned. As soon as the patient has rallied from the operation and from the anesthetic, these bottles may be removed as her comfort suggests.

Under all ordinary circumstances the patient may be lifted on to her side by the nurse, and changed from side to side, as she



desires. This very change of position will tend to prevent the formation of intestinal adhesions.

I have elsewhere advised the hypodermic use of a small amount of morphia with atropia before the administration of the anesthetic. The soothing effect of this continues for some hours after the completion of the operation. If, as its effect passes off, the patient complains of pain, another injection should generally be given for her relief. Many years ago opiates were used too freely, and served many times to so disguise the symptoms as to lull patient and physician into a feeling of fancied security. Following this abuse of the drug there came a period of reaction when, no matter what the nature of the operation or the condition of the patient, opium was almost superstitiously refused. Much unnecessary suffering and doubtless many deaths have been the result. The moderate and careful administration of opium, or its alkaloids, will do no harm, but will in many cases do great good by lessening shock, toning up the heart, and securing sleep. Hard and fast rules cannot be laid down for administering or withholding it, but each operator must rely upon his own judgment and experience.

Nothing should be given in the way of food or drink for several hours after the operation, or until the nausea from the anesthetic has subsided. As soon as the stomach is settled and the patient desires it, she may be given drink in small quantities. Hot water or hot tea will usually be most acceptable. The dictum that no drink should be given for twenty-four hours is based on false premises. It is as unnecessary and cruel as the refusal, a few years ago, of water to fever patients. If the patient suffers greatly from thirst, but the stomach is still nauseated, relief can be afforded by rectal injections of warm water.

Liquids will be what the patient will crave for the first twenty-four hours. After that if she feels hungry nourishment may be given in the way of broths or milk. If the latter is given it should be combined usually with one-fourth its bulk of lime-water. By the third day, if the patient is doing well, a



somewhat more nourishing diet may be given, and soon after full diet, with the exception of the indigestible forms of food. Too great restriction of the diet unquestionably retards convalescence very materially.

The patient should be allowed to use the bed pan in urinating, unless on account of vaginal or perineal work the use of the catheter is necessary.

On the evening of the third day calomel should be given (one grain every hour for three hours), to be followed the next morning by salines until the bowels are opened. As soon as the patient feels an inclination to stool, an enema should be given to assist the operation.

The temperature and pulse should be taken at regular intervals, usually every three to six hours. The pulse range as a factor in prognosis and diagnosis is much more important than the temperature. The temperature is usually slightly sub-normal for a short time after the operation, then as reaction comes on it rises a little above the normal, occasionally as high as one hundred degrees, and then by the second day drops to normal and thereafter remains within physiological limits. A sudden elevation of temperature appearing on the fourth or fifth day or a week subsequent to the operation is usually the result of a stitch abscess and need occasion no alarm. It should lead to a removal of the dressings and examination of the incision.

More or less uterine hemorrhage is quite apt to follow abdominal operations upon the uterus and its appendages, and simulates menstruation. It need occasion no anxiety, but an occasional vaginal douche should be given for purposes of cleanliness.

After the removal of the stitches, usually about the tenth or twelfth days, the bandage should be snugly reapplied and the patient cautioned against any sudden movement of the body or efforts at straining. This bandage should be worn day and night, except when removed for bathing, for one month. During the next month it should be worn simply during the day, and after that laid aside unless retained to meet some special indication.



For the following few weeks the patient should exercise caution against anything like heavy lifting or accidental straining: After that time the abdominal incision may be regarded as fully healed and the patient may perform her ordinary duties.

Stitch abscesses occasionally form either as the result of infection of the sutures before their introduction or from bacteria carried in from the skin during introduction. Such abscesses occasionally form unquestionably from too tight tying of the sutures. These abscesses should be treated simply on general surgical principles and need occasion no anxiety.

After the first catharsis, on the third day, the bowels should be opened daily, or on alternate days, by the use of suitable laxatives.



## CHAPTER XIV.

### OVARIAN TUMORS.

**A**S THE ovary and broad ligament constitute histologically decidedly complex organs, we may naturally expect that a great variety of diseased conditions will be found in connection with their development and degeneration. In the connective tissue stroma are found strands of fibrous and muscular tissue, hence we find springing from this tissue fibromas, myomas, and sarcomas. The epithelial elements of the ovary may give rise to carcinoma, or to cysts and adenomas. The parovarium gives rise to papillomatous cysts and to those springing from the persistent tubules and ducts of the mesonephros.

Ovarian tumors may be divided into two classes, solid and cystic. The solid tumors embrace the fibroma, myoma, carcinoma and sarcoma. These tumors are quite rare, constituting probably not more than one in twenty of ovarian tumors. The fibromas are usually small but sometimes attain very great size. Solid tumors are diagnosticated from cystic merely from their physical characteristics and not from their history.

Cystic tumors may be very small and scattered throughout the ovary or embracing the corpus luteum, (in this category would also be placed the ordinary tubo-ovarian cyst and the little hydatid of Morgagni,) or they may be very large, the result usually of glandular proliferation or adenoma. They may also arise from the parovarium, or be dermoid in origin. In contents all these large cysts present an infinite variety, from the clear and simple fluid of the unilocular cyst of the broad ligament to that which is so firm and unyielding as to be not improperly classed with the solid tumors. When the cyst, as is usually the case, is multilocular it is not unusual to find each compartment as it is opened presenting contents differing markedly from all the rest.

Cysts of Morgagni are found in about ten per cent of adults and are not regarded as pathological. Each cyst is usually about



the size of a pea or grape, and is attached to one of the fimbriæ on the outer aspect of the tube by a small pedicle, usually about one inch in length. The contents consist of clear watery fluid, and the cyst itself is entirely unimportant.

Of the etiology of these growths practically nothing is known. An exception may perhaps be made of the dermoids, which are supposed to be due to the inclusion of blastodermic structures in the early development of the embryo. These cysts may develop at any period of life, but their beginning, if regarded as due to the blastodermic layers, must be traced to intra-uterine existence. They contain usually a large amount of sebaceous material, produced by the sebaceous glands lining the cyst wall. Hair is generally found as well, and also teeth. Bone, unstriped muscular fiber and other materials are occasionally met with. In addition to the dermoid contents proper these tumors may embrace large cysts, the contents of which do not differ from those of other ovarian polycysts. In appearance dermoid cysts differ, as a rule, from ordinary growths in having a dull brown, or yellowish color.

Some *ascites* is a not infrequent accompaniment of an ovarian tumor, especially if the latter is quite movable so as to keep up a low form of peritonitis. The presence of the ascites adds materially to the gravity of the prognosis, as it is most frequently met with in papillary growths or as a result of rupture or torsion of the pedicle.

A tumor with a comparatively long pedicle is liable to become twisted upon itself as a result of some sudden movement or exertion of the patient. The effect of this *twisted pedicle* is to interfere with the return of venous blood from the tumor. Its occurrence is indicated by a more or less marked sudden increase in the size of the tumor, with symptoms of inflammation. As this interference with the circulation is liable to go on to active inflammation, or even gangrene, prompt interference by operative procedures is indicated.



Occasionally *rupture* takes place of an ovarian cyst. This is usually the result of a blow or fall. If the contents of the cyst are unirritating, rupture may do no harm. The effused fluid will be quickly absorbed by the peritoneum, and is carried off usually through the kidneys. If the opening in the cyst wall fails to close so that the fluid does not re-accumulate, a cure will thus result. A number of these cases have been reported.

NATURE'S CURE. In addition to the accidental rupture of a cyst resulting in cure, the tumor may become attached to the bladder, intestine, vault of vagina, or abdominal wall, and when so situated perforation may occur with the discharge of the contents of the tumor and, if the opening remain patent, its final disappearance. A twist of the pedicle, not sufficient to result in gangrene, may take place by which the blood supply of the tumor is so interfered with as to result in atrophy and even disappearance of the tumor.

Cures by any of the above methods are so rare as to constitute merely clinical curiosities, and cannot be depended upon in any case.

Septic infection of ovarian tumors occasionally takes place. The symptoms are usually those common to infection from any other source, but occasionally, owing to the location of the disease, the symptoms are quite similar to those of typhoid fever, for which, indeed, patients have many times been treated.

The presence of the tumor may become such a source of irritation as to excite an acute *peritonitis*. If the growth is of long standing the history will usually point to one or more such attacks. When that is the case the operator may expect to find more or less extensive adhesions to contend with.

The tumor may undergo a sudden increase in size, this increase being marked usually by a good deal of pain and symptoms of shock. The cause of this increase will be found to be due to the rupture of a blood vessel on the inside of the tumor, producing what is known as *intra-cystic apoplexy*. The symp-



toms are quite similar to those of a twisted pedicle and the treatment should be the same.

MALIGNANT TUMORS of the ovary are fortunately not very common. Where such disease is suspected prompt removal should be made, care being taken to sever the pedicle as far as possible from the growth. If omental adhesions have taken place these should also be severed at some distance from the tumor.

SARCOMA is much more common than either fibroids or myomas. Indeed, it constitutes the majority of the solid tumors of the ovary. While usually unilateral, it is so frequently bilateral that both sides should be carefully examined and both ovaries removed if there is any suspicion of malignancy. The tumors usually grow rapidly, and ascites is so commonly present as to be an important point in diagnosis.

CANCER of the ovary is very rare. Its rapidity of growth and the speedy development of cachexia may suffice to establish a diagnosis. If the growth follows the removal of cancer of the breast, this would be an important diagnostic factor. Early immobility is a marked feature, this immobility appearing without history of any local peritonitis.

PAPILLOMA is also fortunately rare. Diagnosis before operation is hardly possible. While not directly malignant, recurrence is so apt to take place that unusually thorough removal is of importance. In operating great care should be taken that none of the contents escapes into the peritoneal cavity as such escape is liable to be followed by secondary infection of the peritoneum and the appearance of papillomatous growths thereon after convalescence.

TUBERCULOSIS of the ovary is generally secondary, the disease primarily appearing in the Fallopian tubes. In cases of general tubercular peritonitis the ovaries become involved, and in this case their involvement is probably secondary. Diagnosis is impossible except when extension of the disease locally may be suspected from its occurrence elsewhere.

DIAGNOSIS. There are a number of conditions which more



or less closely simulate ovarian tumors, but with care the diagnosis can be usually satisfactorily reached.

SALPINGITIS, with a collection of serum or pus in the tube, may closely simulate a small ovarian cyst. The history, its lack of mobility, and its close connection with the uterus will usually establish the diagnosis.

PREGNANCY, especially in unmarried women, has been repeatedly mistaken for an ovarian cyst. The mistake in nearly all these cases has been due to carelessness, the practitioner being thrown off his guard by the social position of the patient. The history of the case, the central position of the tumor, the impossibility of locating the uterus distinct from it, and later the detection of the fetal heart, the placental bruit, the fetal movements and the enlarging breasts, will place the diagnosis beyond question. If the practitioner is still in doubt, a delay of a few weeks will entirely clear up the case.

ASCITES, if encysted, will so closely simulate an ovarian cyst with adhesions that a positive diagnosis may be impossible, from physical signs alone. As such an ascites is usually the result of tu-

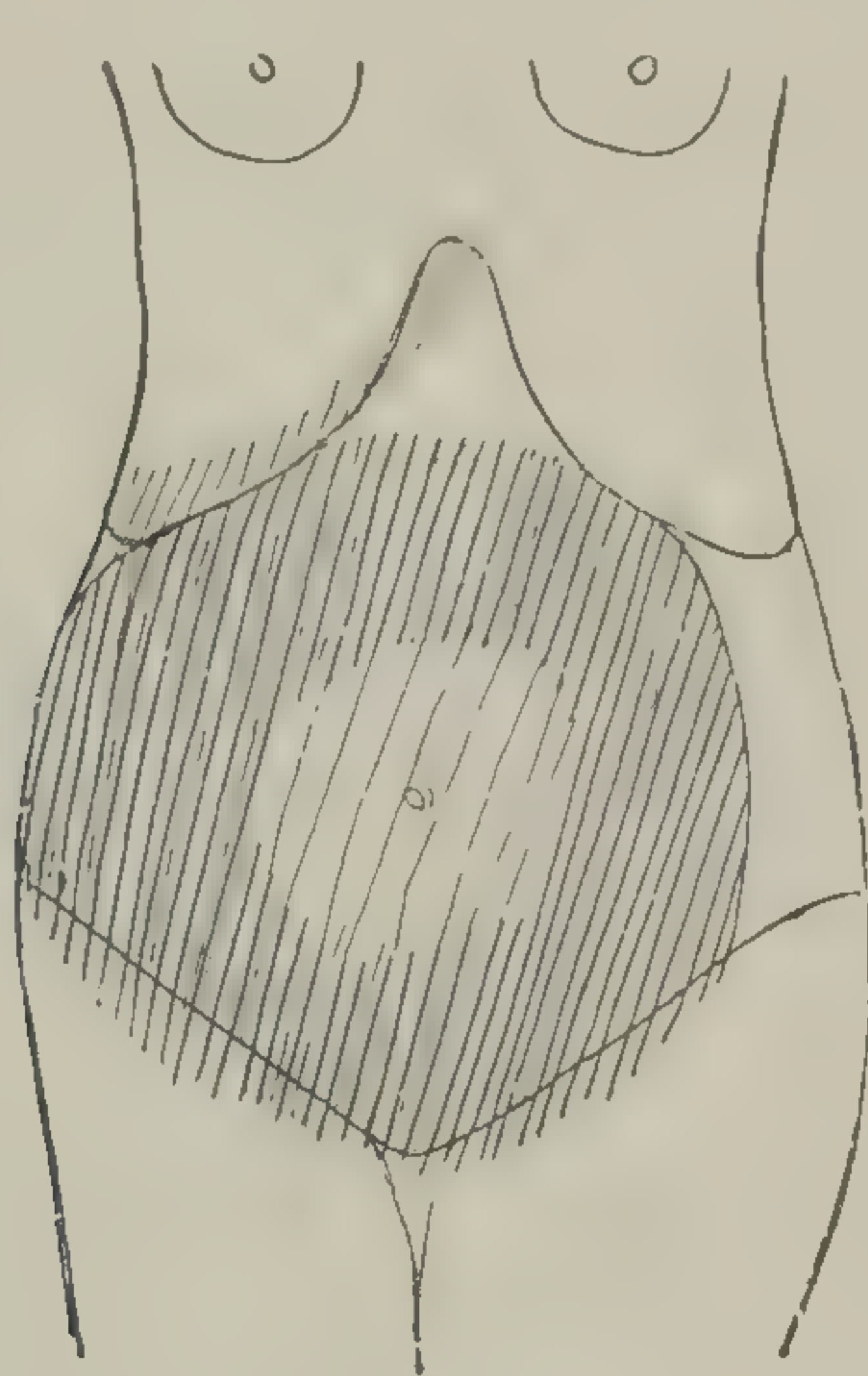


FIG. 68. Showing outline of dullness in case of ovarian tumor.

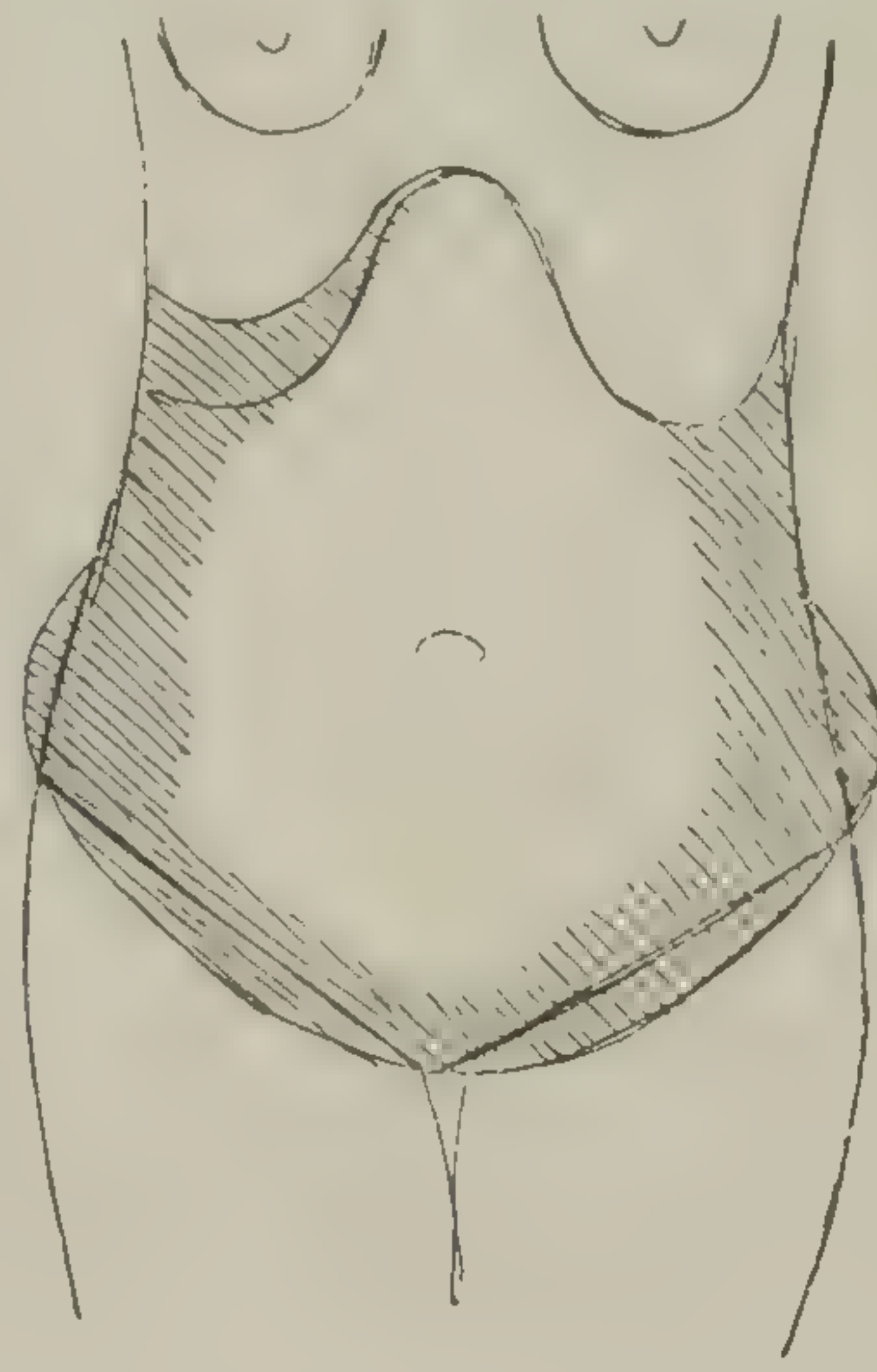


FIG. 69. Showing dullness in ordinary ascites.

bercular peritonitis, the history of the case will, ordinarily, enable a presumptive diagnosis to be made. If the ascitic fluid is not encysted it gravitates to the flanks with the intestines floating in



front, so as to make the more prominent point tympanitic, while ovarian cysts are flat on percussion. If the patient is rolled onto the side the areas of dullness and tympany at once change their location, which would be impossible with an ovarian tumor.

UTERINE FIBROIDS, if sub-peritoneal, may be very difficult to distinguish from a solid tumor of the ovary unless the history of the case throws light upon the condition. As, however, the treatment would be the same, an error of diagnosis is of no special importance.

A DISTENDED BLADDER has caused an error in diagnosis many times. The use of the catheter clears up such a case so easily that it is only necessary to suggest its use when the practitioner feels any possibility of doubt.

RENAL TUMORS, when of large size, sometimes descend into the pelvis and may give all the physical signs of a multilocular ovarian tumor. Close interrogation, however, will usually elicit the information that the growth, when first noticed, was in the side and above the pelvis.

FECAL TUMORS, especially if the accumulation is in the sigmoid flexure or descending colon, may simulate very closely an ovarian tumor on that side. There is usually, however, a history of constipation, and on firmly pressing with the finger upon the tumor it will be noticed that an indentation remains. If there still exists a doubt, active purgation will establish the diagnosis.

AN ENLARGED SPLEEN, like an enlarged kidney, may sometimes bring the diagnosis into question, but the history of its mode of development and the accompanying cachexia will clear up the diagnosis.

It should be borne in mind, in making the differential diagnosis of any abdominal tumor, that the enlarged spleen is always, and of anatomical necessity, on the outside of the descending colon. Tumors developing from the pelvis push the colon to the outside and back. A renal tumor either pushes the colon to the outside or else, developing between the folds of the meso-colon, has the colon somewhat to the outer side and in front. To develop



colonic tympany in some of these cases it may be necessary to inject air into the bowel with a syringe.

CYSTS OF THE OMENTUM, PANCREAS AND MESENTERY must occasionally be excluded. Ordinarily the hand can be passed in below the tumor, showing that it is above the pelvis. If, however, such a tumor, especially if of the omentum, has descended into the pelvis and contracted adhesions its differential diagnosis may be impossible. (The writer has seen one case in which a tumor, originally ovarian, had contracted such adhesions to the omentum as to obtain all its nourishment from that source. Its original pedicle had shriveled up to a long fibrous cord the size of a knitting needle. The origin of this cord and the absence of an ovary on that side established the diagnosis at the time of operation.)

PHANTOM TUMORS. These are curious tumors caused by a peculiar contraction of the anterior abdominal walls, especially the recti muscles, by which there is produced a projecting tumor resembling to the eye absolutely an ovarian cyst. Percussion shows tympanitic note of the bowel and at once clears up the diagnosis. If any doubt still exists, the administration of an anesthetic causes the muscles to relax and the tumor instantly disappears. It is well to note the disappearance of this tumor as the patient passes under the influence of the anesthetic, as otherwise (and such a case is on record) the idea might prevail that the sudden disappearance were due to a rupture of the cyst during the struggles of the patient. (The writer has been called by three different physicians to see a case of supposed ovarian tumor. In each instance the same patient was found, in the person of a highly neurotic and hysterical subject.)

HYDRAMNION may sometimes closely simulate a rapidly growing ovarian cyst. As, under these circumstances, the pathological conditions present will inevitably result in abortion, if nothing more serious, a uterine sound should be passed to establish the diagnosis. The passage of the sound will determine the



pregnancy, if this exists, or by indicating the normal depth of the uterus exclude the presence of the fluid in that organ.

FAT. The rapid accumulation of fat which sometimes takes place about the time of the menopause not infrequently leads to a suspicion of the existence of a tumor. The uniform distribution of the fat, the absence of any distinct outline, and the tympanitic percussion note would establish the diagnosis.

At a former period, when the removal of abdominal tumors other than ovarian was never contemplated, the importance of carefully differentiating these growths could not be overestimated. At the present time, however, when any of these growths are attacked with impunity, it is of prime importance only for the operator to be able to exclude pregnancy, fat, and phantom tumors. Other errors in diagnosis may be somewhat awkward, but if the surgeon is prepared for whatever he may find the errors will not be of serious importance.

PROGNOSIS. "When ovarian tumors attain such a size that the general health is affected, the length of life granted to the patient will probably not exceed two years, and these two years usually consist of a series of troubles, even of torture and despair." (Spencer Wells.) Before the general health is effected, however, these tumors may have been in existence for a number of years. My notes show one case in which, in a maiden lady aged fifty, she was positive she had carried the tumor, weighing over ten pounds, for more than twenty-five years. The tumor was very movable, and at the time of the operation had produced a chronic peritonitis, so that the parietal peritoneum was almost velvety in its vascularity and very much thickened. She made an uneventful recovery.



## CHAPTER XV.

### OVARIOTOMY.

**B**y ovariectomy we mean the removal through an incision in the abdominal wall of tumors of the ovary or parovarium. The term vaginal ovariectomy is used if the tumor is removed through Douglas's cul-de-sac.

If the tumor is a cyst it will be necessary to have in addition to the usual instruments for abdominal sections an ovariectomy trocar. Many complicated trocars are in the market, but the best and simplest is a simple metal or glass tube curved upon itself,

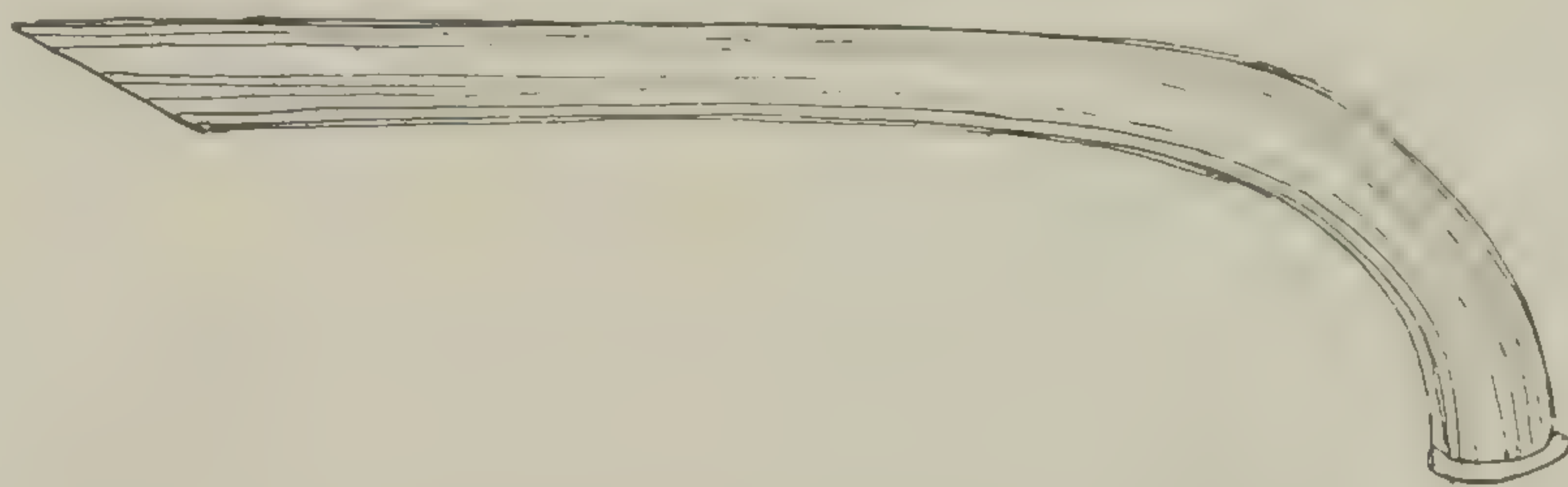


FIG. 70. Trocar for tapping ovarian cysts. A rubber tube should ordinarily be slipped over the distal end, to convey fluids into a receptacle on the floor.

with a point sharpened like that of a quill pen (Fig. 70). As such a point is not very sharp it will occasionally be necessary in tapping very tough cysts to partially incise the wall with a knife at the point where this trocar is to be inserted. A few feet of rubber tubing attached to the other end of the trocar serve to convey the fluids into a tub under the table.

THE INCISION should be a short one: if the tumor is cystic it can be emptied and withdrawn through a very small opening, while it is a simple matter to enlarge the opening later if it becomes necessary.

The cyst wall having been exposed by the incision, two or three gauze sponges should be introduced so as to protect the peritoneal cavity from any possible leaking of fluid from the point of insertion of the trocar. These being in place,



THE TROCAR is thrust into the cyst, at the upper end of the incision, by a quick, positive motion. If the cyst is tapped at the lower portion of the incision it will as it collapses tend to draw the opening below the incision. If the contents are limpid they will readily be discharged through the trocar into the receptacle beneath the table. As the cyst is being emptied the assistant should press upon the sides of the abdomen so as to keep the cyst in contact with the anterior abdominal wall. At the same time the operator should seize the cyst wall with forceps, and as it collapses little by little draw it through his incision. If the contents prove too thick to pass through the trocar the cyst wall should be freely incised and its contents evacuated. As such cysts are invariably multilocular it will be necessary to introduce the fingers, or even the entire hand, into the first cyst and break through into the other cysts so that all may be discharged. If the cyst is not very large it will be better to enlarge the abdominal incision and withdraw it intact. It is especially important to thus remove these cysts if their contents are purulent, or if they are found to be dermoid.

ADHESIONS. The omentum and intestines are not infrequently adherent to the cyst. These adhesions can usually be pushed off with the fingers or sponge without any special hemorrhage. If, however, the omentum is firmly adherent, with large blood vessels coursing through it to the tumor, it must be transfixed and ligated by chain ligatures (Fig. 15). Either fine silk should be used for this purpose or animal ligature. The omentum should then be severed, a clamp having been previously applied below the point of section to prevent recurrent hemorrhage. If in separating intestinal adhesions the peritoneal coat is found to be denuded and oozing, its edges should be caught together by fine silk or catgut. If the adhesions are so firm as to threaten the integrity of the bowel in separating them, the cyst wall should be carefully incised near the point of adhesion and the adherent portion left attached to the bowel. It is not necessary to leave the entire thickness of the cyst wall, as the wall can be split with the



fingers so as to leave only the thin peritoneal layer attached to the bowel. A few sutures should then be introduced so as to fold this flap of cyst wall upon itself that there may be no surface exposed. The method of introducing these sutures is indicated in

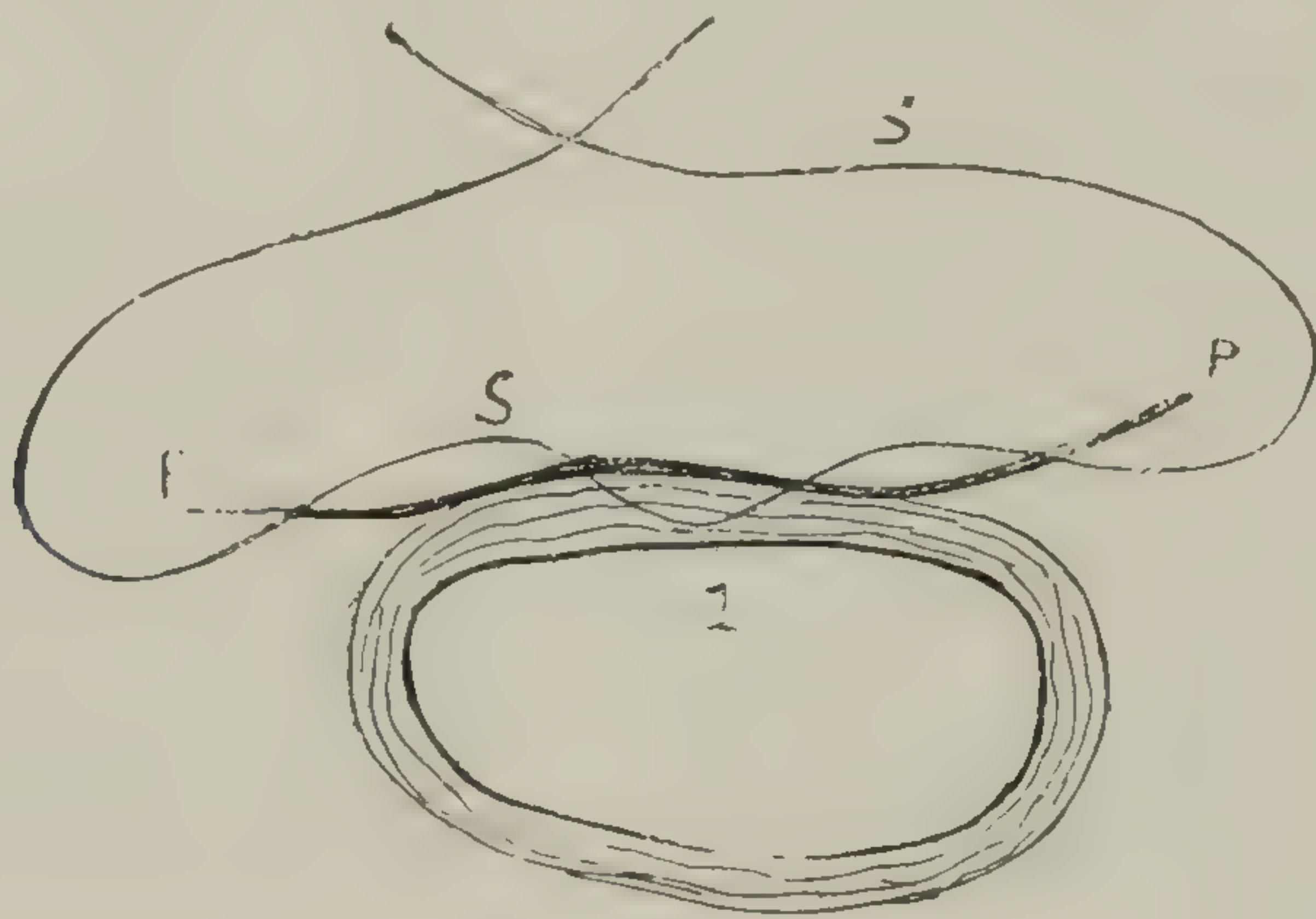


FIG. 71. Showing method of closing-in a portion of tumor wall so as to leave no raw surface exposed.

the accompanying cut (Fig. 71). Adhesions of the tumor within the pelvis can ordinarily be separated without much difficulty by finding and following the lines of cleavage. After separating all adhesions,

THE PEDICLE will be reached, and this is usually long enough to permit the entire delivery of the cyst. If the pedicle is short it will be best to clamp it close to the cyst and amputate the latter. The cyst being thus out of the way, it will be a very easy matter to isolate and properly ligate the pedicle. If the pedicle is small it may be transfixed and ligated *en masse*. If it is too broad, or too broad and thick, to be safely trusted to the *en masse* ligature, it will be necessary to ligate with chain ligatures. Under these circumstances it is better to isolate the arteries and ligate them singly, as secondary hemorrhage occasionally ensues from shrinkage of the pedicle when only *en masse* ligatures are used. In severing the tumor it is important to see that the button of tissue above the ligature is of such size that it will not slip through the ligature and thus release the blood vessels. After severing, the end of the stump should be held in view by seizing a bit of tissue below the ligature in forceps so that the operator may satisfy him-



self that there is no oozing from the cut surface. This pedicle should be held in view by forceps rather than by pulling on the ligature. Hemorrhage having been satisfactorily controlled the operator should then proceed to attend to the

COVERING OF THE STUMP. As about one per cent. of all the deaths following ovariectomy result from intestinal obstruction due to the adhesion of a loop of bowel to the stump, it is of manifest importance that the end of the stump should, if possible, be protected or covered.

In the removal of ordinary ovarian tumors which are supplied with a pedicle of greater or less size, one of two procedures should be resorted to to obviate leaving a raw surface. If the pedicle is large it should be clamped as high up as possible for the temporary control of hemorrhage, and the tumor removed; next the peritoneum on the anterior surface of the pedicle, or, if none can be easily obtained here, then on the posterior surface, should be dissected down until a sufficient flap is obtained, and the pedicle then ligated in sections at the base of the flap, but not including it; the portion of pedicle above the ligature is cut off, and the raw surface, including the ligature, covered in by the peritoneal flap, which is caught down with fine catgut.

In case the pedicle is not too large it can be ligated in the usual way, care being taken merely to keep the ends of the ligature on the anterior face of the pedicle. The pedicle is then severed as usual, and the raw end of the stump covered by rolling it against and under the posterior surface of the broad ligament. This is done by passing the ends of the original ligature through the broad ligament from behind forward, about half an inch apart, and tying them. As the ligature is tightened the raw surface of the stump rolls down until it is completely covered by the broad ligament (Fig. 72). Adhesions form at once. I have used this method of covering the stump very many times and with uniform satisfaction.

The opposite ovary should next be examined, and if found diseased, should be removed.



Many years ago, before ovariectomy became an established operation, it was customary to temporarily relieve the patient by the withdrawal of the contents of the tumor through a canula or aspirator. This operation known as

TAPPING should never be resorted to except under the most extraordinary circumstances. As ordinarily performed, it is more dangerous than the operation itself, while it frequently results in a peritonitis which, if not fatal, leaves behind extensive adhesions to render a subsequent operation more hazardous.

Aside from the peritonitis, the chief dangers are from hemorrhage following the puncture of a vessel in the wall of the cyst, or from the escape into the peritoneal cavity of papillomatous

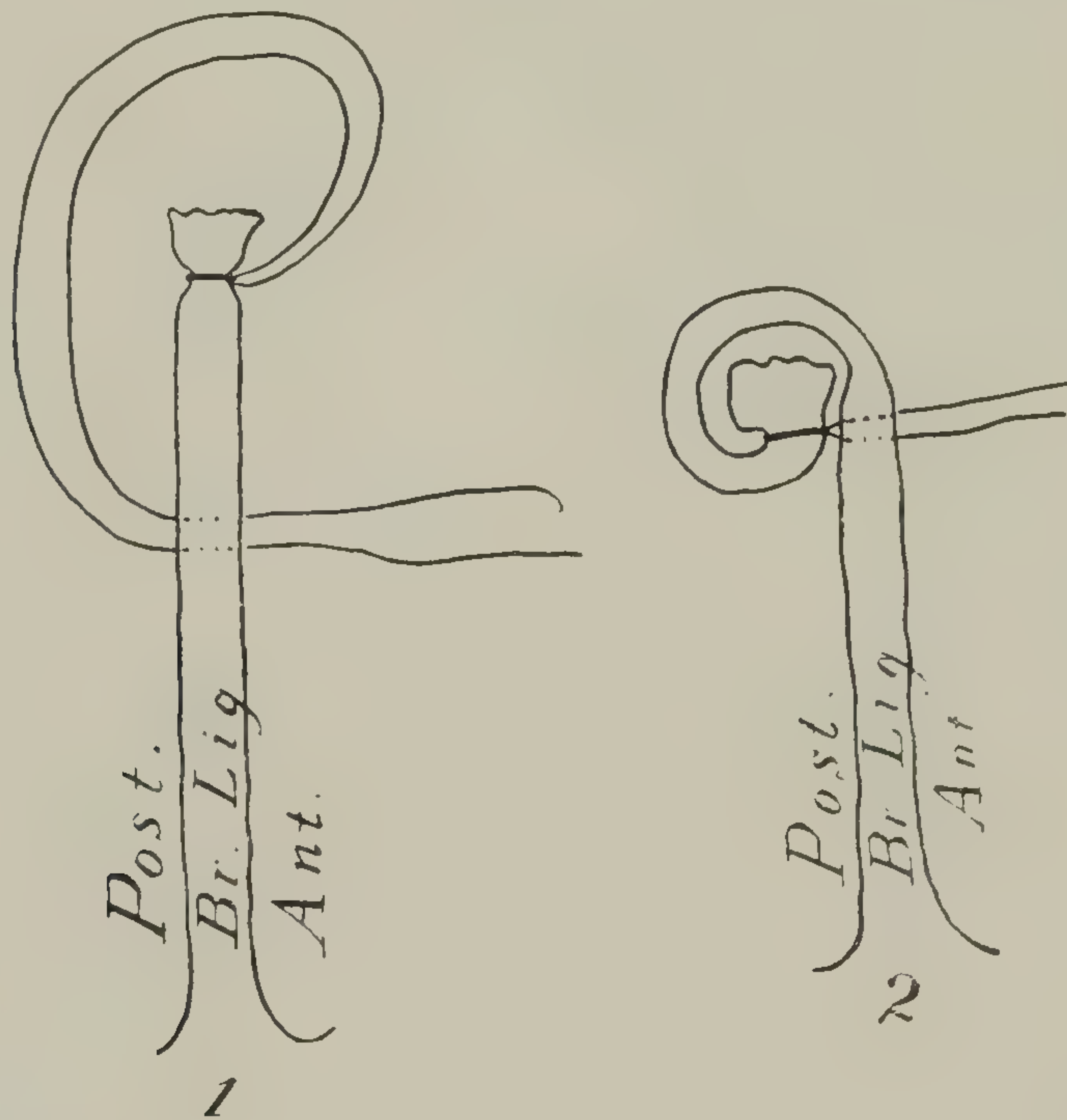


FIG. 72. Author's method of covering in the end of the pedicle to avoid exposure of raw surface.

contents with extended infection of the peritoneum. Just the mortality of tapping cannot be estimated, but it is probably not less than 15 per cent. The tapping of single cysts is much less dangerous than that of multilocular growths or dermoids.

ENUCLEATION. It occasionally happens that ovarian tumors have no pedicle whatever, or at least none which can be so



separated as to permit of its ligation. Under such circumstances the peritoneal covering of the cyst should be incised and the cyst itself carefully shelled out of its bed. This can usually be accomplished with comparatively little difficulty. As this enucleation is completed there will probably be a number of bleeding points which must be seized and ligated with very fine silk or catgut. Hemorrhage being controlled the peritoneal edges are brought together and sutured so as to obliterate the bed of the tumor. If hemorrhage from the capsule cannot be satisfactorily controlled, or if its cavity cannot be safely obliterated by sutures, it will be necessary to attach the edges of the capsule to the margins of the abdominal incision at its lower end and insert a drainage tube, or gauze wick, so as to secure obliteration of the cavity. This marsupialization, as it is called, of the capsule is undesirable and will very seldom be necessary. Convalescence is much prolonged by such treatment, and the risk of hernial protrusion at the point of attachment is greatly increased.

INCOMPLETE OVARIOTOMY. It occasionally happens that the operator finds such extensive and firm adhesions of the tumor, these adhesions being usually in the pelvis, that he deems it wise to abandon all attempts at its complete removal. Under such circumstances he removes the contents of the cyst and then attaches the cyst wall to his abdominal incision, as described in the previous paragraph. Hour-glass contraction of the uterus and adherent placenta are phenomena almost invariably occurring in the practice of immature obstetricians. Cases requiring incomplete ovariectomy are limited, practically, to the clientele of immature gynecologists.

OÖPHORECTOMY. By this is meant the removal through an abdominal or vaginal incision of the ovaries, usually with the Fallopian tubes, for diseases chiefly inflammatory, or their removal in order to precipitate the menopause. The conditions requiring this operation are seldom met with except in connection with hydro- or pyo-salpinx. Certain forms of nervous disease, in which the symptoms seem to be dependent upon or aggravated



by menstruation, are sometimes greatly benefited, or even cured, by this castration. The operation, however, should only be made after careful study of each case and preferably with the counsel and advice of the neurologist.

A few operators resort to this operation in some cases of uterine myoma in the hope that the menopause thus induced will bring about an atrophy of the growth. The operation, however, so frequently fails to secure this result, while its inherent dangers are so nearly as great as those of myomectomy, or hysterectomy, that surgical sentiment at the present time is almost unanimously against its performance.

OVARIAN TUMORS AND PREGNANCY. The occurrence of pregnancy in a woman having an ovarian tumor is a serious complication. The peril may be regarded as increasing with each month of gestation, and to be greatest at its termination. The cyst is liable to become twisted upon its axis, to rupture, to incarceration in the pelvis, or, if large, to produce serious pressure symptoms upon the pelvic and thoracic viscera. At the time of labor, owing to the contraction of the abdominal walls, rupture is liable to take place, or, if the cyst is in the pelvis, the unavailing efforts of the uterus to expel its contents may result in rupture of that organ. The bruising of the cyst may result in the occurrence of suppuration, or of a general peritonitis if the peritoneum suffers most. There is, therefore, no difference of opinion as to the proper treatment of these cases. After the fourth month, however, the liability to abortion increases with the increase in the period of gestation. If pregnancy reaches full term, and the tumor is found to impede delivery, ovariectomy should be made at once. If it is out of the way and offers no special difficulties, labor should be allowed to terminate and the tumor to remain until convalescence from the puerperium has become established. If, however, at any time during her confinement unfavorable symptoms should arise, immediate removal of the tumor should be undertaken.



If the operation is done especially during the early months with care not to handle the uterus, the patient will probably go on without difficulty to full term. My own experience is limited to a single case in which, at the third month, I removed two ovarian tumors, each about the size of a fetal head. Especial care was taken not to expose the uterus, and the patient was safely delivered at full term.

PERITONITIS AND TUMOR. If peritonitis arises as the result of the presence of a tumor, operation should be instituted at once unless the inflammation is running a very mild course. In that event, delay is advisable until the inflammation has subsided. As peritonitis results in adhesions, the operation should be made within a few weeks and before these adhesions have had time to become firm.



## CHAPTER XVI.

### UTERINE FIBROIDS.

**U**NDER this title will be considered both the myomatous and fibromatous enlargements of the uterus, as the distinction between the two forms of growth is rather of laboratory than of clinical importance.

**ETIOLOGY.** Nothing is known as to the causes leading to the development of fibroids. Several fanciful theories have been advanced, but nothing is known.

After the age of thirty-five fibroids are found in about twenty per cent. of women. It is generally believed that they occur more frequently in the negro race than the white.

The tumor may consist of a single mass developing apparently from a single center, or hundreds of small tumors may involve the entire uterus. In size they vary from a barely perceptible enlargement to more than one hundred pounds in weight. They sometimes grow slowly; at other times develop with startling rapidity.

While usually hard and unyielding to the touch, in the variety known as fibro-cysts the sensation is so distinctly that of a cyst as to result in many errors of diagnosis.

Four varieties may be described, according to their method of development:

1. Interstitial, in which the growth is quite uniformly distributed through the uterus; no distinct masses being distinguishable. The womb may seem to be symmetrically enlarged, but on section more or less irregularity in distribution is easily apparent.

2. Intramural. In these the fibroid nodules of greater or less size are found in the walls proper of the uterus. The centers of development may be numerous, but they are distinct.

3. Sub-peritoneal. In these the fibroid, which may have begun as an intramural, has developed toward the surface, so



that it becomes covered merely by the peritoneal coat of the uterus and comes to possess a distinct pedicle.

In rare cases such a pedunculated tumor forms adhesions to neighboring parts, and through them receives its nourishment to such an extent that finally the pedicle becomes absorbed and the fibroid, though of uterine origin, seems to have been developed from other than uterine tissue.

4. Sub-mucous. In this the fibroid develops toward the cavity of the womb and finally comes to project into it, being covered merely by the mucous membrane, and ultimately becoming distinctly pedunculated, when it becomes a uterine polyp. Martin (F. H.) assumes that of all tumors the interstitial constitute fifty-five per cent., the sub-peritoneal twenty per cent., the intramural fifteen per cent., the sub-mucous ten per cent.

While usually these growths are confined to the body of the uterus, they not infrequently invade the cervix and may be limited to that part of the organ.

The growth sometimes extends laterally, separating the folds of the broad ligament, and thus constitutes what is known as intraligamentary fibroid.

DEGENERATION. Fibroids, especially in elderly people, sometimes undergo calcareous degeneration. Such a fibroid, if sub-mucous, may be expelled from the uterus as a foreign body, and then constitutes what is known in popular parlance as "a womb stone."

When the tumor co-exists with a pregnancy it may, following delivery, undergo fatty degeneration, together with the uterine walls, and entirely disappear.

Inflammation ending in suppuration may take place, resulting usually in the death of the patient from infection, although if the discharge takes place externally, recovery may follow. If there is too great interference with the vascular supply the tumor may become gangrenous.

Colloid, sarcomatous and cancerous changes occasionally



take place. Of these the most frequent, probably, is the sarcomatous.

DIAGNOSIS. Not infrequently these tumors will be found to have attained considerable size before they give rise to any symptoms leading the patient to consult a physician. They sometimes are found by accident during examinations made for other purposes. When, however, they have produced such symptoms as to lead to a consultation, leucorrhea and menorrhagia, or metrorrhagia, will usually be quite prominent symptoms.

The amount of leucorrheal discharge and of hemorrhage has no necessary relationship to the size of the tumor. A very small sub-mucous fibroid or polypus may give rise to most profuse discharges. If the growth is entirely sub-peritoneal, hemorrhage is rare. As the growth becomes larger, pressure symptoms may be the chief source of complaint. The growth imprisoned in the pelvis presses upon the bladder and rectum and may give rise to great distress. The displacement upward of the mass, either by the surgeon or by the process of development, gives sometimes such marked relief that the woman considers herself cured. The physical signs are those of a solid tumor, and this tumor must be differentiated from other conditions.

PREGNANCY is the condition most frequently mistaken for fibroid. Stress must be placed upon the irregular development of the tumor. If the growth is of the interstitial variety, repeated examinations will probably be necessary to establish a diagnosis, or perhaps it will be necessary for the lapse of time to clear it up.

CANCER of the fundus may produce symptoms almost identical with those of fibroid in the same location. Even the foul odor of a cancer may be closely simulated by that of a sloughing fibroid. Dilatation of the cervix and an examination under an anesthetic would probably, in all cases, establish the diagnosis.

RETROFLEXION may easily be mistaken for a small fibroid in the posterior wall. Thorough bimanual examination, or, if necessary, the careful introduction of the uterine sound, will clear up the diagnosis.



An old hydro- or pyo-salpinx, or a fibroid or multilocular cyst of the ovary, if adherent to the uterus, may give every indication of a fibroid. An error in diagnosis in any of these conditions is of no great moment, as the treatment of the different conditions is practically the same.



FIG. 73. Uterine polypus.

FIG. 74. Inversion of uterus.

By vaginal examination alone the two conditions closely simulate each other.

INVERSION has been mistaken many times for uterine polypus (Fig. 73-4), and there are few considerable communities in which there are not traditions of the amputation of the inverted uterus through a mistake in diagnosis of this kind. Digital examination may not clear up the case, as in either condition the cervical canal can be distinctly made out as a collar surrounding the neck of the tumor. The diagnosis is at once settled by careful bimanual examination, under an anesthetic if necessary, when in the case of a fibroid polyp the uterine body will be found in its proper position. If, on the contrary, the case is one of inversion, no uterine body can be felt above the mass in the vagina.

In cases of inversion careful inspection will enable the surgeon to find the openings on each side of the Fallopian tubes.

It occasionally happens that a sub-mucous fibroid of the



fundus produces inversion of the uterus, so that we have the two conditions existing together. In such a case bimanual examination would determine the fact of an inversion, while palpation and inspection would show the presence of the sub-mucous fibroid in the most dependent part of the vaginal tumor.

FIBROIDS AND PREGNANCY. While the co-existence of a uterine fibroid and pregnancy may be sometimes unimportant, it is so liable to result in disaster as to give the intelligent physician serious anxiety until their association ends. The presence of a fibroid usually results in abortion, and this may be the end of the trouble. Occasionally, however, owing to the inability of the womb to properly contract, the secundines are not entirely expelled and the fibroid may be so situated as to prevent their removal by the fingers or curette. Under these circumstances, as has happened in one case in my own experience, hysterectomy may be the only recourse.

If the pregnancy goes to full term the tumor, if situated in the lower segment of the uterus or cervix, may offer an insuperable obstacle to delivery and necessitate Cesarean section, to be completed, if necessary, by hysterectomy. If abortion does not occur and delivery is safely accomplished, the danger from post-partum hemorrhage is great, and of septicemia from infection of the tumor.

On the other hand, as has been stated elsewhere, the tumor may undergo involution, together with the uterus, and may even entirely disappear.



## CHAPTER XVII.

### UTERINE FIBROIDS.—Treatment.

**M**EDICAL TREATMENT. A number of remedies have been recommended from time to time, as of value in the treatment of uterine fibroids. It is doubtful, however, if there is anything in the materia medica that effects, in the least, the progress and evolution of these tumors. Among the remedies which have been recommended may be named ergot, *Cannabis Indica*, *hydrastis Canadensis*, potassium bromide, and arsenic. It is possible that ergot, by producing contractions of the muscular fibers of the uterus, may tend to drive an intramural fibroid toward either the peritoneal or mucous surface, but it would only occasionally happen that any benefit would accrue from this action of the ergot.

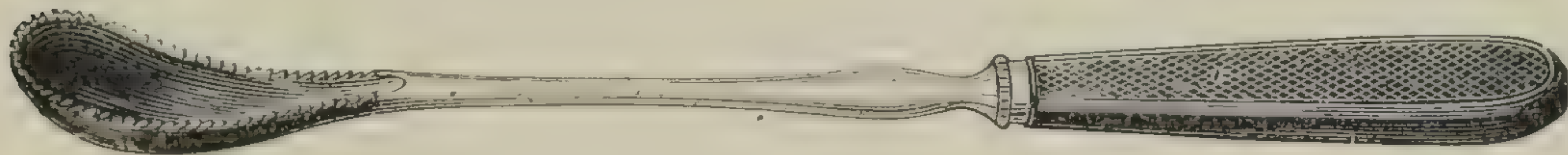


FIG. 75. Thomas' spoon saw.

ELECTRICITY has been lauded by a few specialists, but it is far from being a safe remedy, even in the most expert hands, while its field of usefulness is limited to a small class of tumors.

SURGICAL TREATMENT. If the tumor has become sub-mucous and has a distinct pedicle, in other words is a uterine polyp, the cervix can be dilated, being, if necessary, incised so as to get more room, the tumor drawn down by a strong volsellum forceps, and severed at its point of attachment either by curved scissors or the ecraseur. The dangers of the use of the ecraseur are so great that the instrument has long since been practically relegated to the limbo of the museum. Traction upon the tumor sometimes produces a partial inversion, so that it is necessary to use caution in severing the pedicle, lest the uterine wall be opened at the same time. If no pedicle has been formed, the mucous membrane over the tumor may be freely incised and the tumor enucleated by Thomas's spoon saw (Fig. 75) or by mor-



cellation. For the employment of either method full dilatation of the cervix is essential. In morcellation the most accessible portion of the tumor is seized with a volsellum forceps and cut out by means of strong curved scissors. Before the piece is detached another portion of the tumor should be grasped by another forceps so that the tumor may not slip up beyond reach, and this process of seizing and cutting is continued until the whole is removed. This method of removal, although tedious and requiring great care to avoid injuring the uterine wall, which is sometimes very thin, gives, on the whole, very satisfactory results.

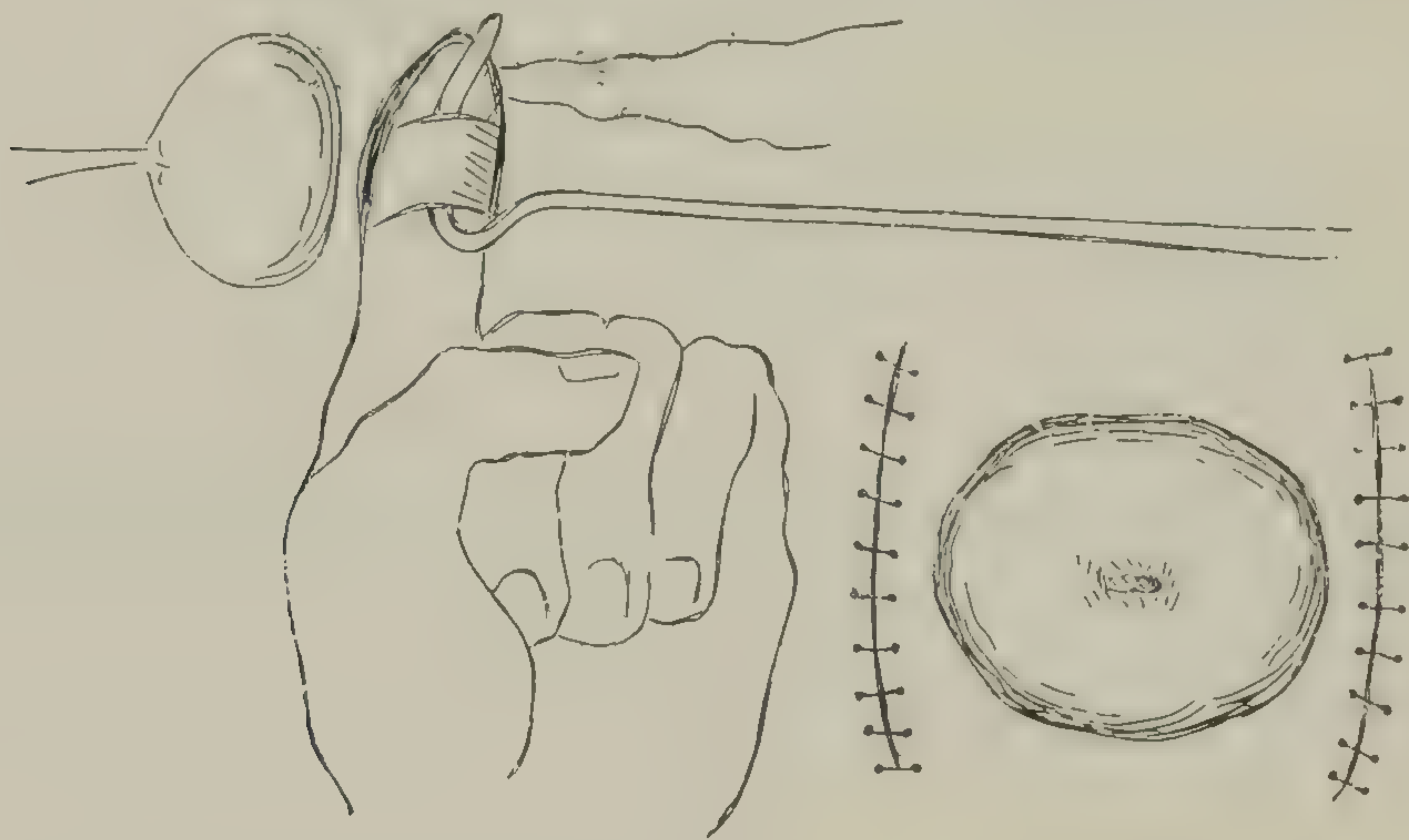


FIG. 76. Martin's operation for ligating the uterine arteries, showing method of introducing ligature, and the operation as completed by closing the two incisions in the vaginal vault.

The cases, however, in which such a procedure is feasible are not common.

**ACCIDENTS.** The hemorrhage from the manipulations necessary to remove such a sub-mucous tumor, either by the spoon saw or morcellation, is apt to be considerable. The patient will usually lose much more blood than from a properly conducted abdominal hysterectomy. The uterine wall, which is very much thinned, may be perforated and thus the peritoneum become infected. Inversion may take place as the result of too firm traction; this, if recognized at once, would probably do no particular harm, as the tumor could be quickly enucleated and the uterus reinverted. The chief danger is from infection from the large



exposed surface and the amount of manipulation necessary, especially when morcellation is undertaken.

MARTIN'S OPERATION consists in ligating through the vaginal vault the uterine arteries (Fig. 76). The operation is not difficult unless the growth of the tumor has been such as to interfere with vaginal manipulations. The mucous membrane at the vault of the vagina is incised about a half inch from each side of the cervix, each incision extending antero-posteriorly and being about an inch in length. Through this opening the surgeon can feel the uterine artery pulsating. With a curved needle, or ligature carrier, a ligature is passed around the artery, which is then severed between the uterus and the ligature. The same manipulation is practiced on the opposite side. The ligatures are left long and brought down through the incisions, which are then partially closed, or if the operator prefers they can be cut short and each incision entirely closed.

The design of the operation is to secure atrophy of the tumor by thus cutting off, to a large extent, its blood supply. A number of cases have been reported in which the operation has proven successful. In most cases, however, the ovarian arteries supply so much of the nourishment for these tumors that their growth, even if temporarily checked, is not in the end materially interfered with. The operation, therefore, has not met with much favor. It is chiefly indicated in cases in which, on account of exhausting hemorrhages or other reasons, a more radical operation cannot prudently be undertaken. It is not applicable to tumors of large size, or to those which are producing pressure symptoms. In fibroids involving the broad ligaments the parts are so distorted as to render the operation sometimes impossible because of the inability to locate the uterine arteries.

CASTRATION, by which is meant the removal of the appendages so as to bring about the menopause, has been adopted by some operators, and has been brought into prominence especially by Tait. Its dangers, however, are almost as great as those of



abdominal hysterectomy, and the failures to check the growth are so numerous that this operation is seldom resorted to.

**HYSTERECTOMY.** The most satisfactory treatment in the vast majority of cases of uterine fibroids (excepting polypi), when, from their size or location, active interference is demanded, is unquestionably hysterectomy. Small tumors producing no symptoms and discovered by accident do not require operation. The wise physician, indeed, will not inform his patient that she is the possessor of any such unwelcome growth: for his own protection he better inform the husband, or some other friend, but the patient herself should be kept in ignorance until such time as symptoms develop. Usually, however, the surgeon is consulted because symptoms have arisen by which the patient has become aware that something is wrong with her pelvis or abdomen. Under such circumstances a plain statement of her condition should be made, and the question of operation must be decided after careful investigation and consultation. The social condition of the patient will have much to do with deciding as to an operation. If the patient is wealthy, so that she can give herself plenty of rest and care, it might be wise to defer an operation which would be indicated at once in the case of a patient obliged to earn her own living. The experience and skill of the surgeon must always enter largely into the determination of the advice which he will give. It was formerly supposed that these tumors tended to become stationary or diminish in size with the menopause, hence, if the patient were approaching that age delay was uniformly advised. At the present time, however, with larger knowledge, we know that no dependence can be placed upon the menopause, but that, on the contrary, in a large number of cases, the tumor commences to grow more rapidly at that time, or to undergo, in a small but not inconsiderable number of cases, malignant degeneration.

Hysterectomy, therefore, is unquestionably indicated in tumors of rapid growth, or where there is severe hemorrhage,



ascites, pressure symptoms, kidney disturbances, or evidences of degeneration.

Two methods of abdominal hysterectomy have been used. In one the stump is brought out at the lower angle of the wound

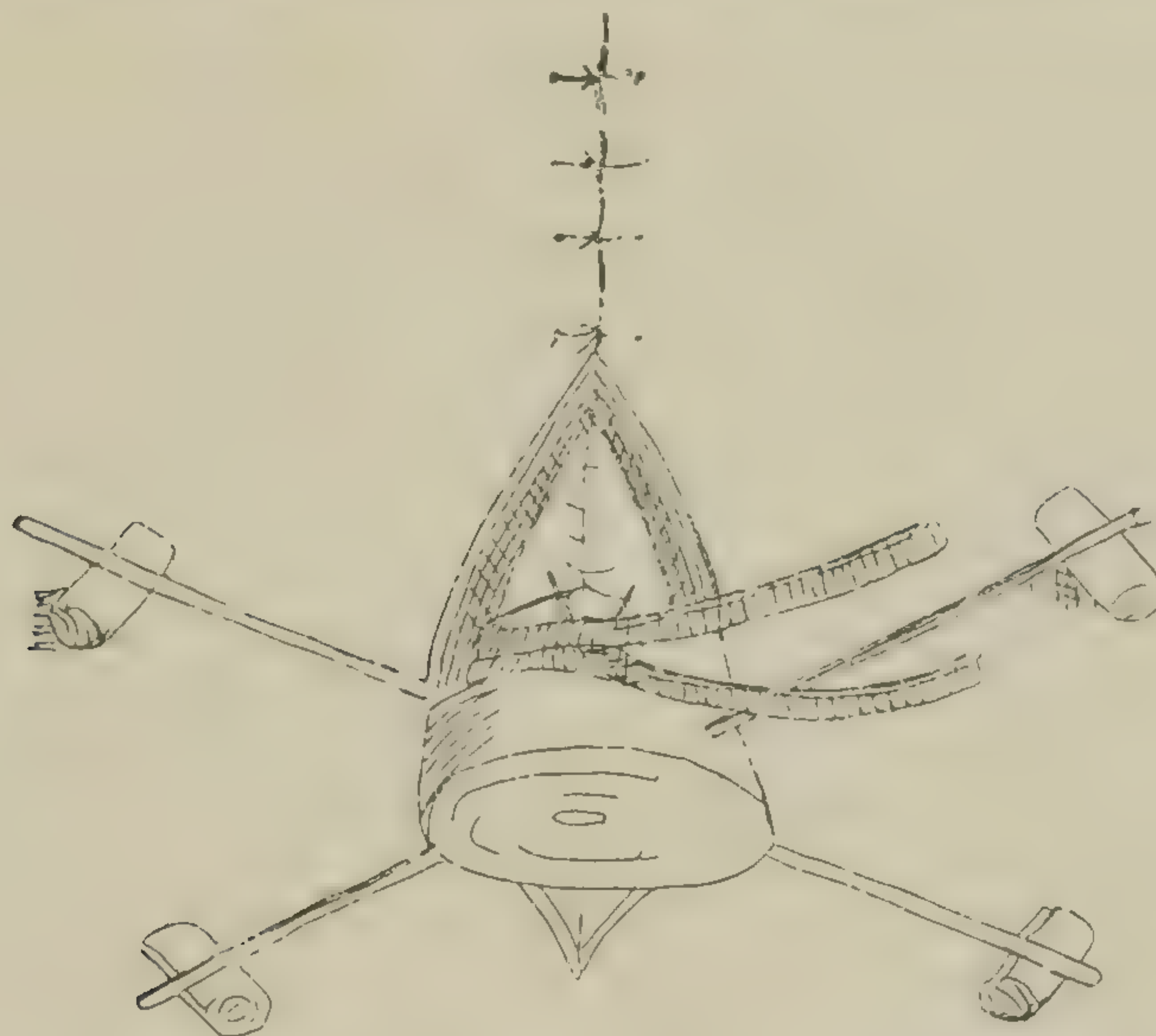


FIG. 77. Showing extra peritoneal treatment of the stump, by ligation with rubber cord transfixed by supporting needles and closing of incision down to the stump

and treated extra-peritoneally (Fig. 77). In the other, hemorrhage is controlled within the pelvis, the stump covered over, and the abdomen closed as after any other abdominal operation. While the extra-peritoneal method is still employed by a few surgeons, it is in general disfavor, the objections to it being the increased danger of infection, the weak spot left in the abdominal wall, with consequent danger of hernia, and the prolonged period required for convalescence. Moreover, it sometimes happens that, owing to a short vagina and short pedicle, there is too great tension upon the stump, so that its inclusion in the incision is a source of pain.

In operating by this method the abdomen is opened in the usual way, the tumor drawn out, an elastic ligature placed around the cervix below the mass, and the uterus amputated above the ligature. The cervix is transfixed by long needles designed for the purpose, these needles passing through the cervix and also through the elastic ligature to prevent the latter from slipping



off. The parietal peritoneum is now carefully stitched to the peritoneum of the stump and the abdomen closed. The stump is covered with sterilized dressings, preceded, if there is any tendency to oozing, by per-chloride of iron. As healing takes place the elastic ligature cuts its way into the pedicle and finally, at the end of about two weeks, the portion of the pedicle above the ligature drops off. Some operators use a serre-nœud with a wire instead of the elastic ligature, but the method of operating is the same.

The intra-peritoneal method of operating has been a matter of growth, and the history of this growth is interesting. The method which I have used with very great satisfaction for several years differs somewhat from that adopted by most operators, the differences being along the lines of greater rapidity in operating, better support to the pelvic floor and more complete covering of the raw surfaces.

After opening the abdomen in the usual way, by as free an incision as necessary, and drawing up the uterine mass, I seize the

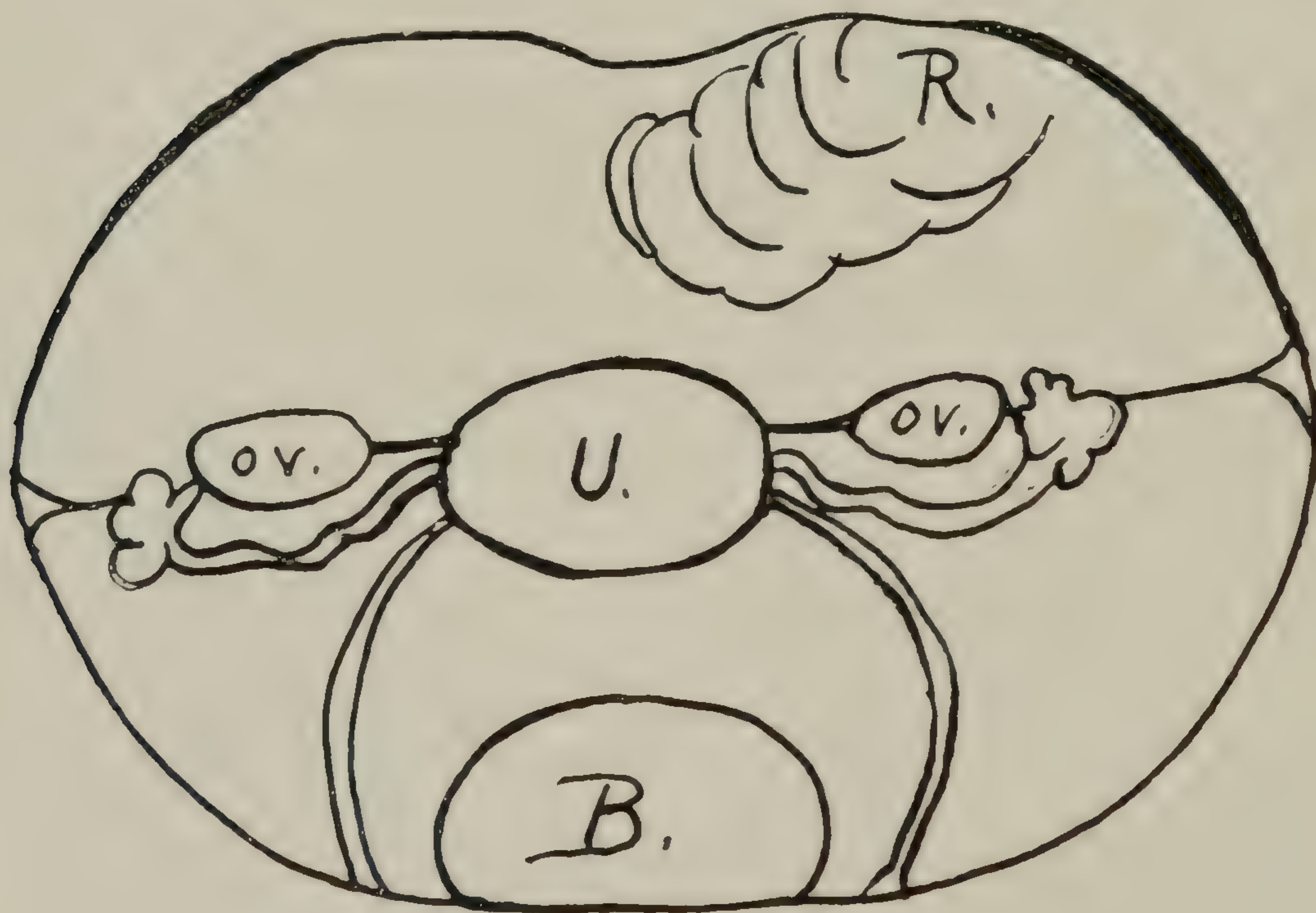


FIG. 78. Diagram of pelvis seen from above.  
*b.* bladder ; *ov.* ovary ; *r.* rectum ; *u.* uterus.



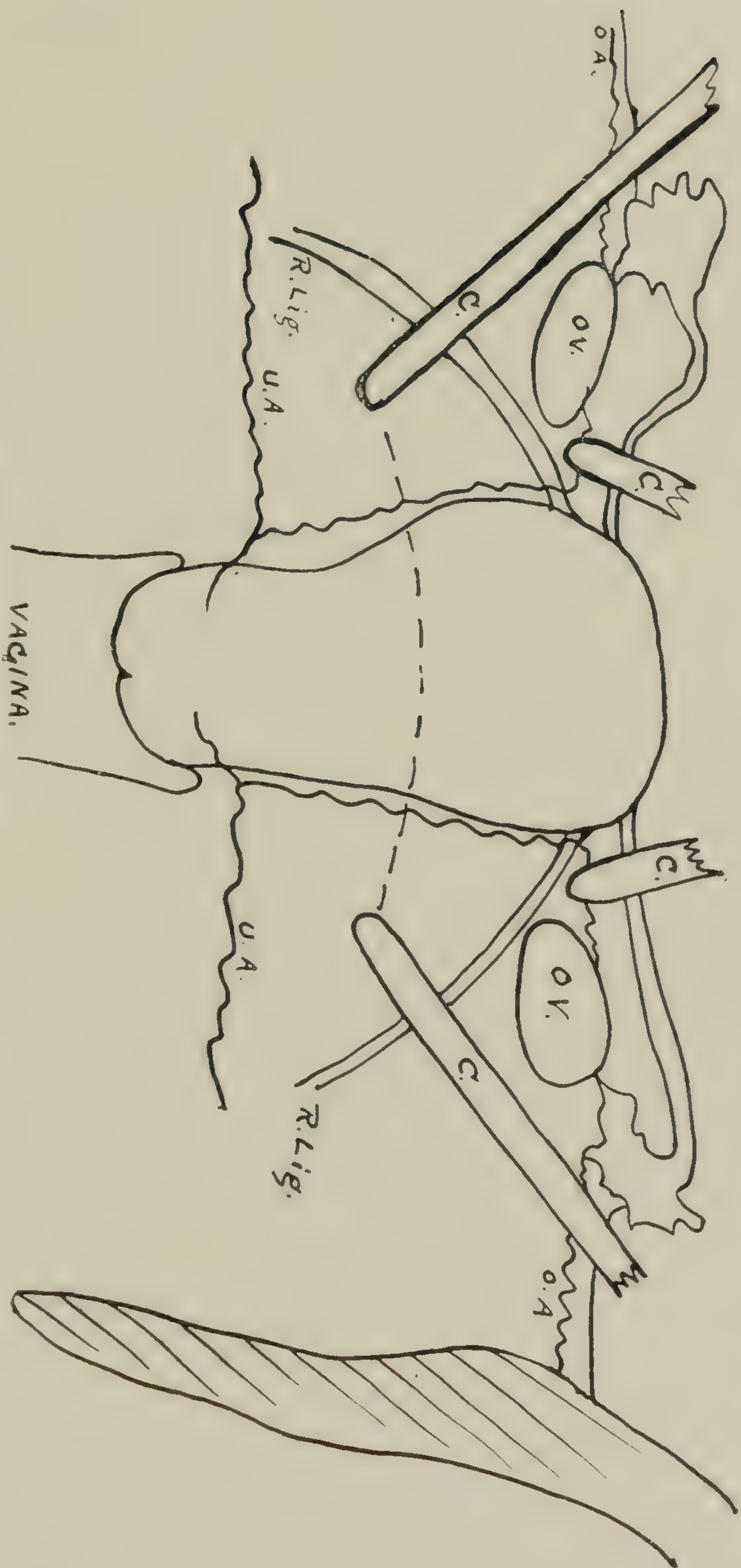


FIG. 79. Diagram of operation—front view.

*c. c. c.* clamps; *o. a.* ovarian artery; *ov.* ovary; *u. a.* uterine artery.  
Broken line represents peritoneal flap.



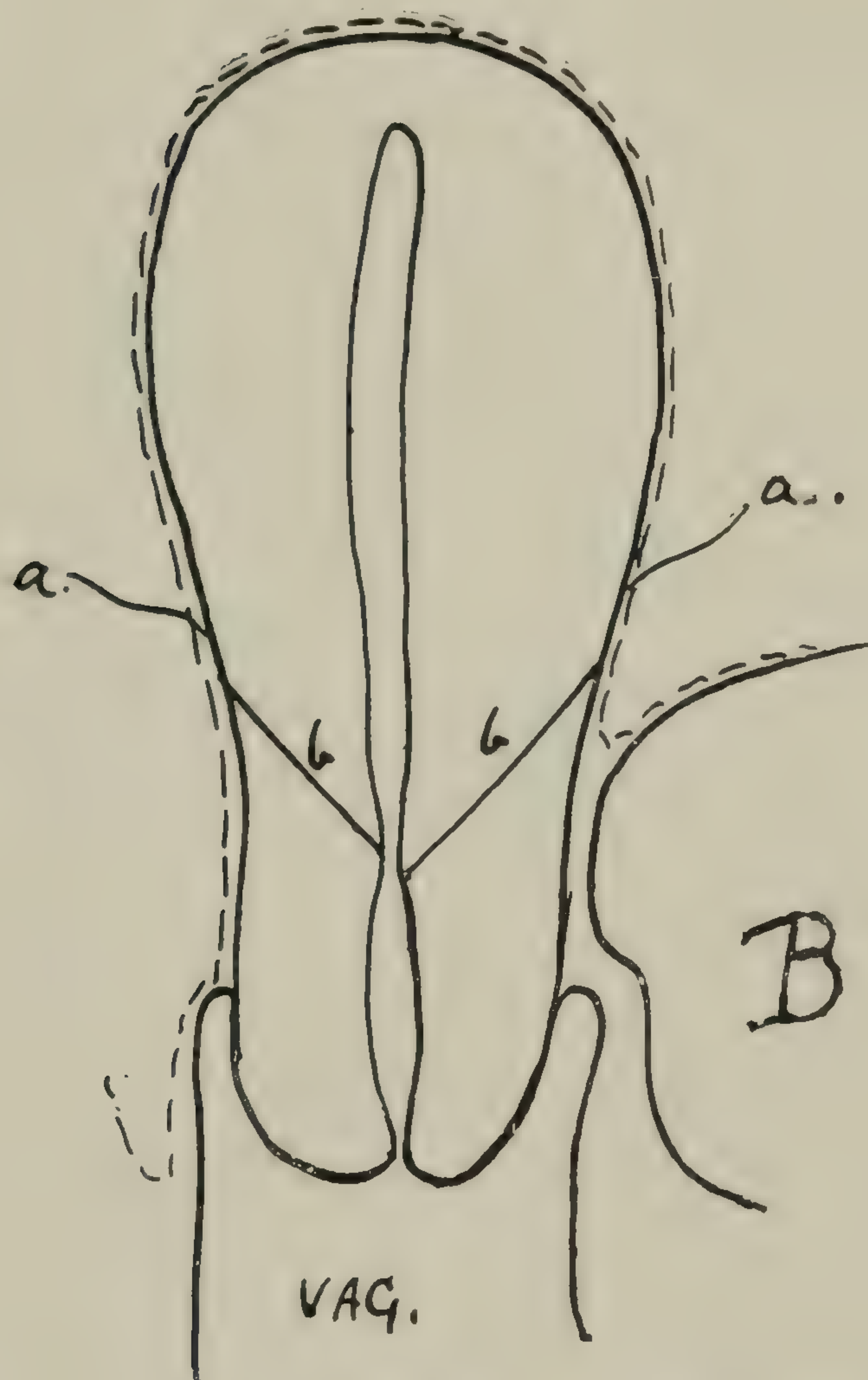


FIG. 80. *a. a.* points of making peritoneal flaps; *b. b.* lines of amputation of cervix  
Dotted line represents peritoneum.

most accessible broad ligament, just outside of the ovary, with a long clamp, the end of the clamp being directed obliquely toward the uterus; an ordinary hemostatic forceps, or short clamp, is then attached to the upper border of the ligament next to the uterus, so as to prevent recurrent hemorrhage through the ovarian artery; with scissors the broad ligament is then severed along the clamp first applied; the other broad ligament is then usually treated in the same way; with scissors a peritoneal flap is then made in front, between the tips of the two clamps, and the bladder separated from the uterus; a similar flap is then made posteriorly, but this is usually shorter.



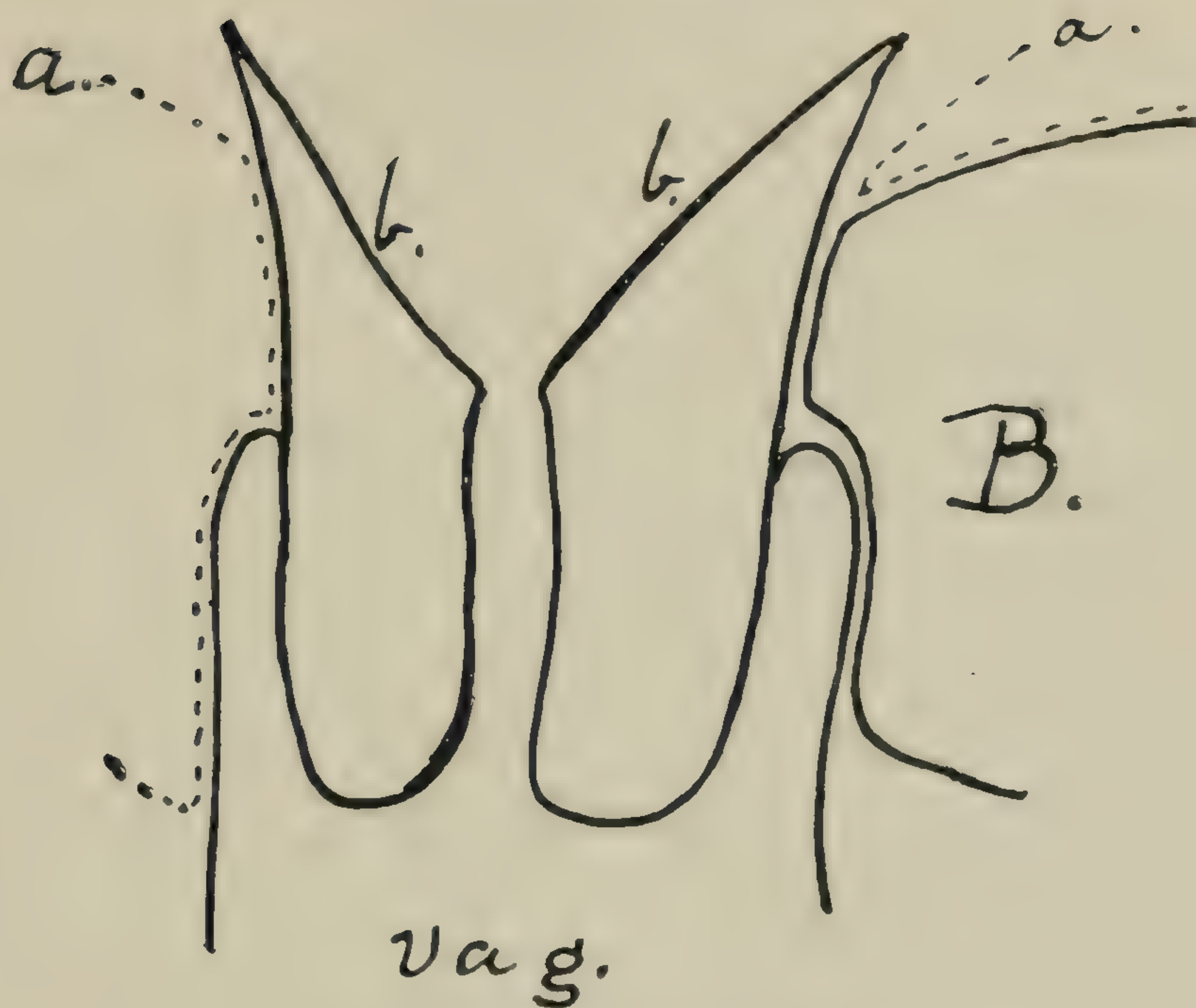


FIG. 81. *a. a.* points of making peritoneal flaps; *b. b.* lines of amputation of cervix.  
Dotted line represents peritoneum.

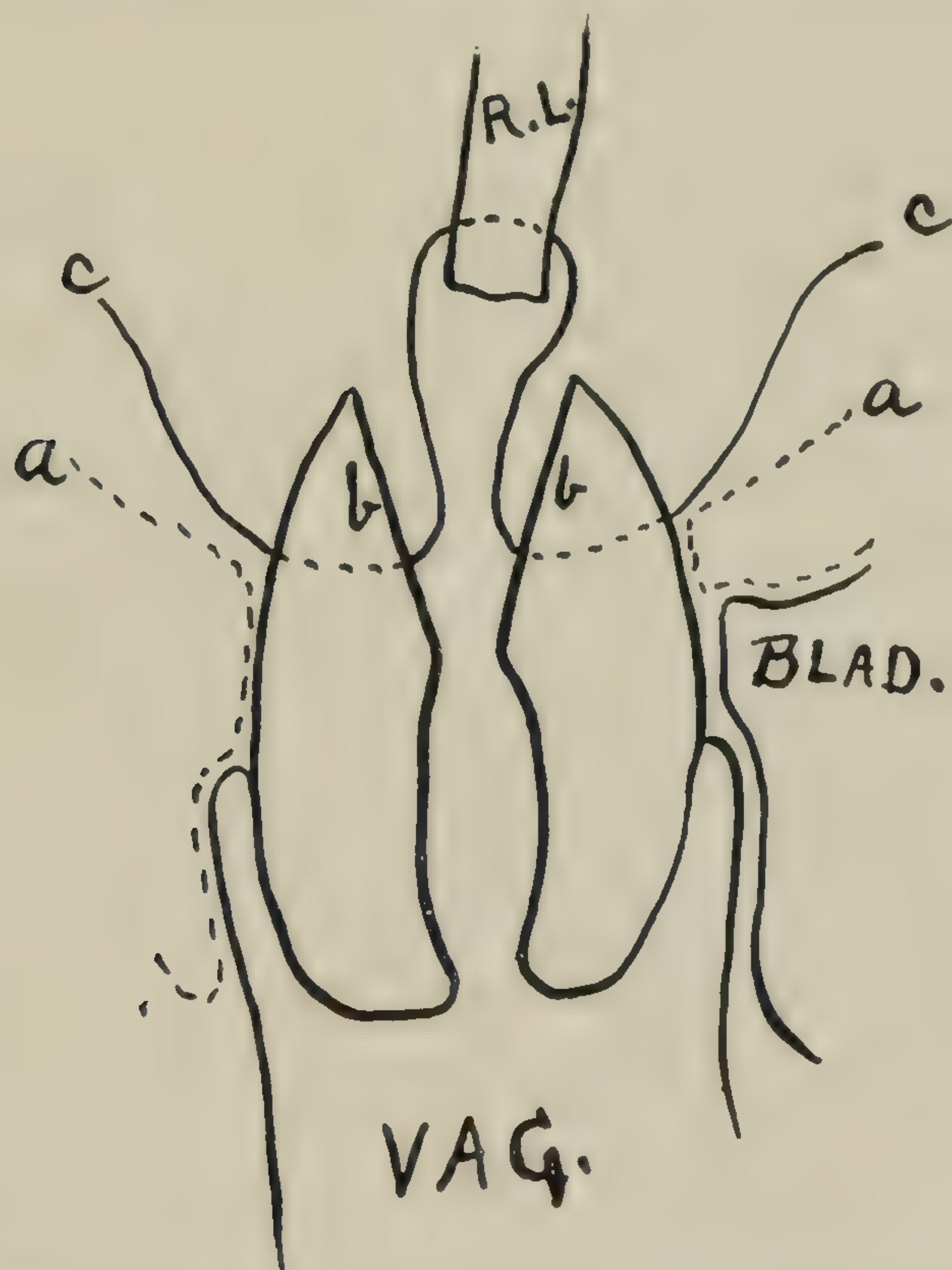


FIG. 82. Showing method of bring down and fastening round ligaments in closing cervical flaps.  
*a. a.* peritoneal flaps; *b. b.* cervical flaps; *c. c.* suture; *r. l.* end of round ligament.



At this stage the uterus itself has not been interfered with, and the uterine arteries have not yet been reached. With the fingers the layers of the broad ligament are separated on each side, between the end of the clamp and the uterus, and the uterine artery seized with a long forceps. With long scissors curved on

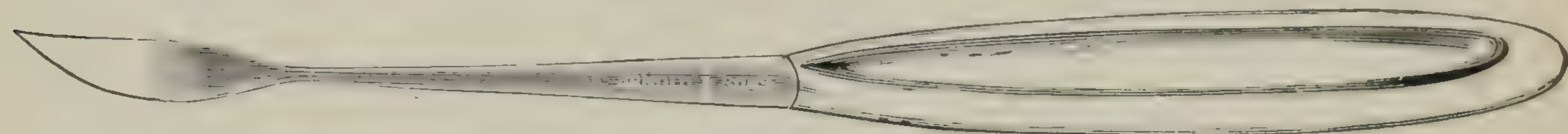


FIG. 83. Kelly's spud for separating the body from the cervix.

the flat (or, better still, with a Kelly's spud, Fig. 83), the uterus is next detached at or just below the level of the internal os, being detached as to give an anterior and posterior flap of uterine tissue. In case there is any difficulty in opening the broad ligament so as to reach the uterine artery before detaching the uterus itself, its seizure may be omitted until the artery spurts, as the uterus is being severed, when it is seized by an assistant with a long forceps. It is frequently difficult, or even impossible, to seize both arteries before getting the tumor out of the way. In that case, I cut across from one side and as I draw the mass upward, after separating the uterine tissue, the base of the broad ligament is grasped *en masse* below the point of separation, and the tumor then enucleated from below up, without hemorrhage. This is the method recommended by Kelly, and one which, in many cases, possesses points of advantage.

The uterine mass has now been removed and the pelvis is empty. Hemorrhage is entirely controlled, except perhaps a little oozing from the cervical tissues. The uterine artery upon each side is next separated from any surrounding tissue which may have been seized in the grasp of the forceps, and ligated as far back as possible, with rather fine silk, catgut or kangaroo tendon, and the projecting end snipped off. The round ligament is then seized with a forceps next to the clamp, so as to prevent its retracting, and the clamp removed from the broad ligament. The ovarian artery is at once caught with forceps and drawn out from between the folds of the broad ligament, ligated with fine silk, and



the projecting end cut off. The same is then done upon the opposite side. A long silver probe is now threaded with a strip of iodoform gauze, about one inch wide, passed through the cervical canal into the vagina, and seized by an assistant. The gauze is drawn through the cervix, except an inch or two which I hold in my fingers, and the probe detached as it appears at the vulva. The end of the gauze which I have held in my fingers is now cut off just flush with the bottom of the wound. The passage of this gauze not only mechanically cleans the cervical canal, but also secures drainage in case of any oozing.

With kangaroo tendon the uterine flaps are now brought into apposition by a running suture. With the first insertion of this suture upon one side, the round ligament of that side is brought down and transfixed, so as to be implanted, when the suture is tied, between the flaps on that side. The same is done with the opposite round ligament just before completing the suture on that side. If the round ligaments are too long, they can be shortened so as to give the desired degree of support to the stump. Commencing, next, at the upper edge of one broad ligament stump, the peritoneal layers are inverted and with kangaroo tendon, or catgut, a continuous "over-and-over" suture is applied, running down the broad ligament, then across over the cervical stump, turning in the peritoneal flaps as it proceeds, and up on the opposite side. This suture should be so inserted as to draw together snugly the tissues of the broad ligament, which being thus snugly apposed, unite so as to make excellent supports for the stump in addition to the round ligaments. The operation as thus completed leaves a perfectly smooth pelvic floor, with, at no point, the exposure of any raw surface for adhesions.

In case, owing to too extensive adhesions or other complications, drainage of the pelvis is desired, this is accomplished by opening Douglas's cul-de-sac and introducing a gauze drain. The abdomen is then closed in the usual way.

In case it is desirable to remove the entire uterus, the cervix, instead of being cut across, is enucleated in the usual way. In



such case I always introduce a pledget of gauze for drainage at the point of separation of the cervix, but close completely the floor of the pelvis, as above described.

The advantages of this method of operating are:

- (1) Such a shutting off of the vagina as to reduce to a minimum any danger of infection from that source.
- (2) The ligature placed around the uterine artery is entirely outside of the uterine wound, and being of fine material and buried in the tissues is much less likely to give any trouble.
- (3) The snug closing of the cervical tissue prevents oozing.

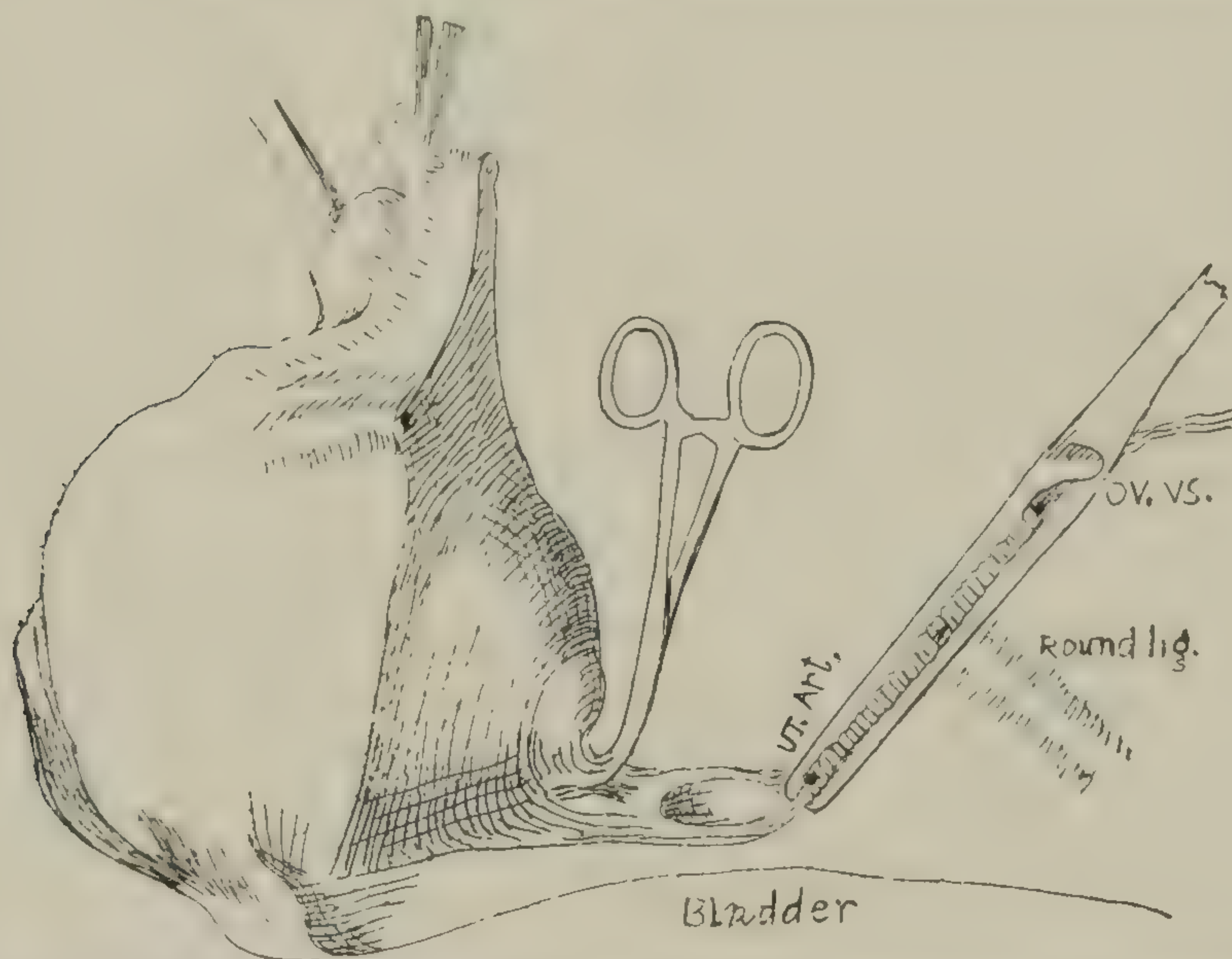


FIG. 84. Kelly's method of removing the uterus by passing down on one side and then across and up, modified by using long clamp on broad ligament instead of ligatures.

- (4) The smooth peritoneum in the floor of the pelvis, having no projecting stumps or raw surfaces, reduces to an absolute minimum the danger of intestinal adhesions.

- (5) The implantation of the round ligaments and puckering in of the stumps of the broad ligaments prevent prolapse of cervical stump and vagina.

- (6) The use of the clamps on the broad ligaments obviates hemorrhage, leaves the parts in better shape for the subsequent steps of the operation, and saves considerable time.

In cases of intra-ligamentary fibroids, those in which the



tumor develops from the uterus into one broad ligament, the method of Kelly, as described above, should always be adopted (Fig. 84).

ACCIDENTS. Hemorrhage is possible after this as after any other operation, but if the four arteries are secured with a fine ligature, after being isolated from surrounding tissue, hemorrhage from these vessels is practically impossible. It should be borne in mind, however, that irregular branches are occasionally met with, so that after ligating these main vessels the field of the operation should be scanned and other bleeding points attended to.

The bladder, especially in cases of large tumors, is sometimes drawn up by adhesions in front of the tumor. It may extend up as high as the umbilicus. Under these circumstances it is very liable to be wounded if the operator enters the abdomen by too precipitate an incision.

The intestines are sometimes firmly adherent to the tumor and may be torn in separating the adhesions.

The ureter is occasionally involved in these tumors, especially if the growth is composed of multiple masses. It occasionally happens that the tumor originally started below the ureter and in developing has lifted it up until it passes more or less directly over the growth. Care is necessary, therefore, in all these cases to examine carefully before separating any tissue in which the ureter might possibly lie.

With the care which is ordinarily exercised in abdominal work, the danger of sepsis is very remote. The danger is unquestionably somewhat increased in cases of complete removal of the uterus, as the enucleation of the cervix not only opens the vagina, which can never be regarded as entirely sterile, but also leaves exposed the large amount of connective tissue from which the cervix has been removed and which is in excellent shape for the absorption of infection.

It is for this reason, chiefly, but also because its retention gives a better point for supporting the vagina, that most opera-



tors prefer to leave the cervix in doing hysterectomy. It is only in cases of marked disease of the cervix that its removal should be regarded as obligatory.



## CHAPTER XVIII.

### VAGINAL HYSTERECTOMY.

NOT considering matters of minor detail there are, in brief, but two methods of making vaginal hysterectomy: One by the use of ligatures, the other by the use of clamps. The former method is that which has been used most frequently in America and in the greater part of Europe. The French surgeons, on the contrary, have generally made use of clamps.

As most of the details of the operation are the same with each method, I will first describe that by the use of clamps, as I have witnessed it performed by Richelot, Pean, Segond, Aubeau, and other noted French hysterectomists, and as I have many times performed it myself.

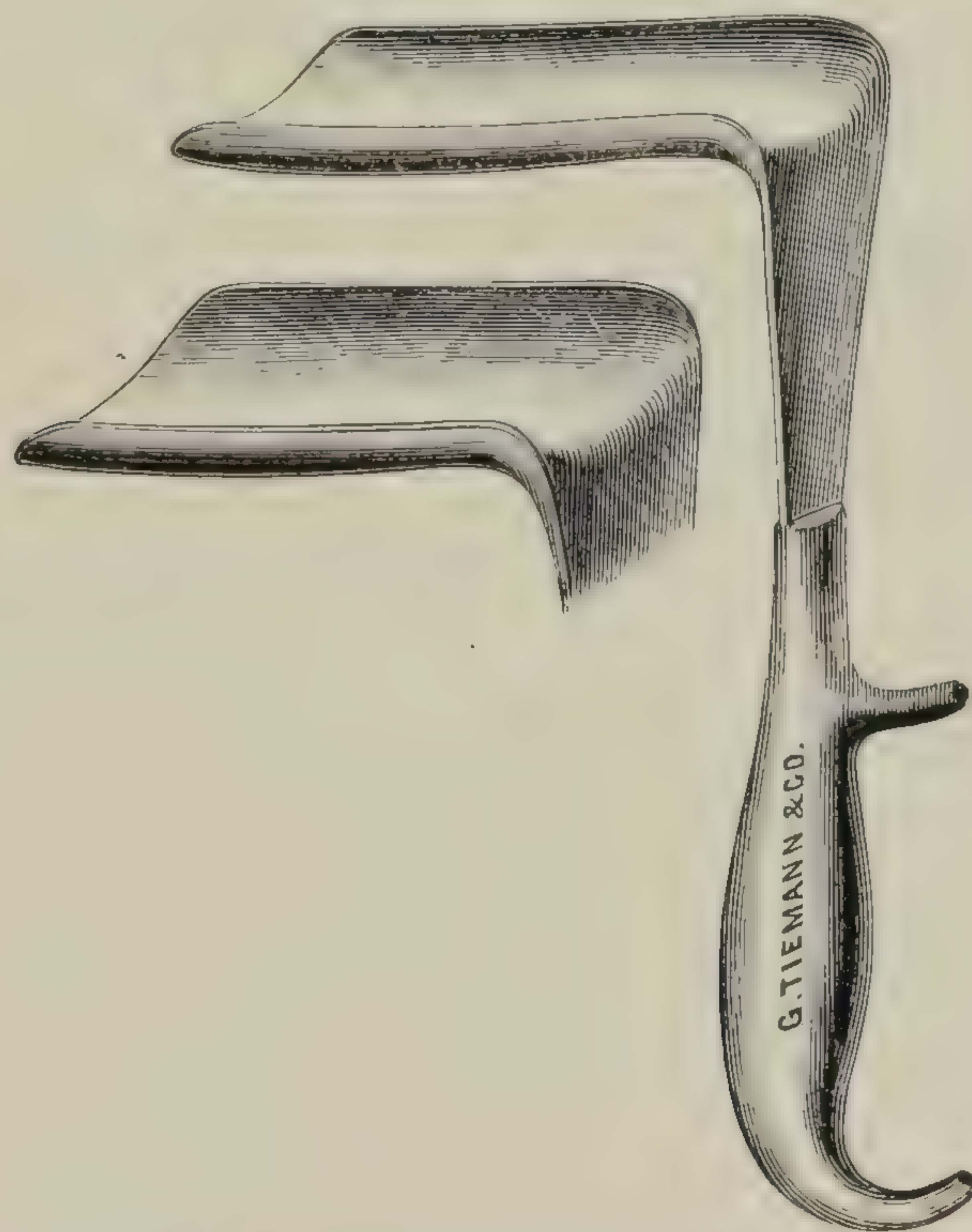


FIG. 85. Perineal retractor for vaginal hysterectomy.

The preparation of the patient is similar to that for other capital operations. The vagina is thoroughly sterilized. If the endometrium is septic it is thoroughly curetted and the cavity



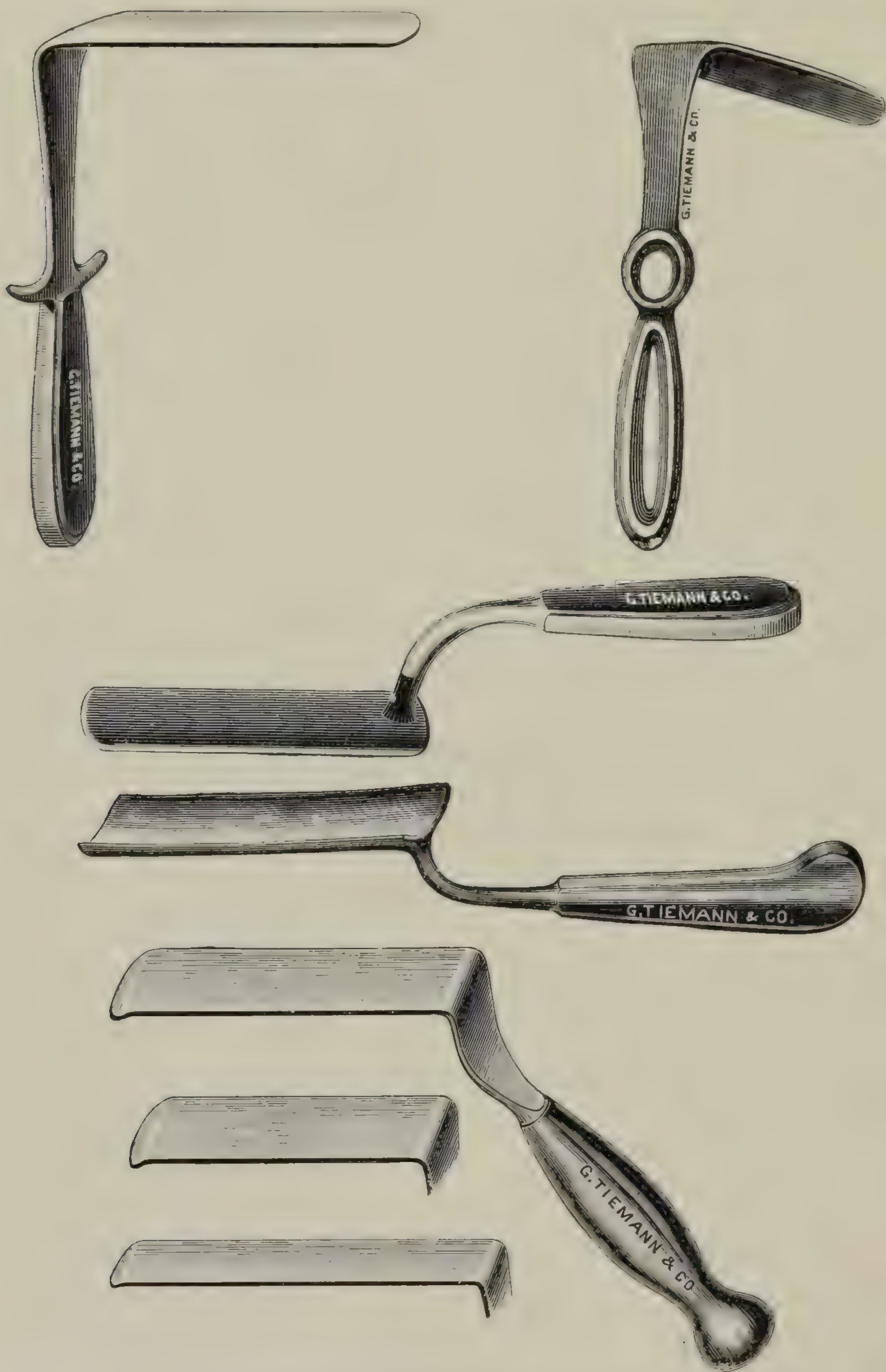


FIG. 86. Various forms of retractors.



injected with some antiseptic. The bladder is emptied, the pubes shaved, and the parts surrounding the vulva protected with gauze or towels moistened with bi-chloride. The perineum being drawn back by a retractor (Fig. 85), and the lateral and anterior walls by Pean valves (Fig. 86) or other retractors, the cervix is firmly seized with a volsellum. The five-toothed forceps (Fig.



FIG. 87. Richelot's forceps for hysterectomy.

87), of Richelot is probably the best. The uterus being drawn down, a circular incision (Fig. 88) is made completely around the cervix with curved scissors or a long-handled bistoury. This

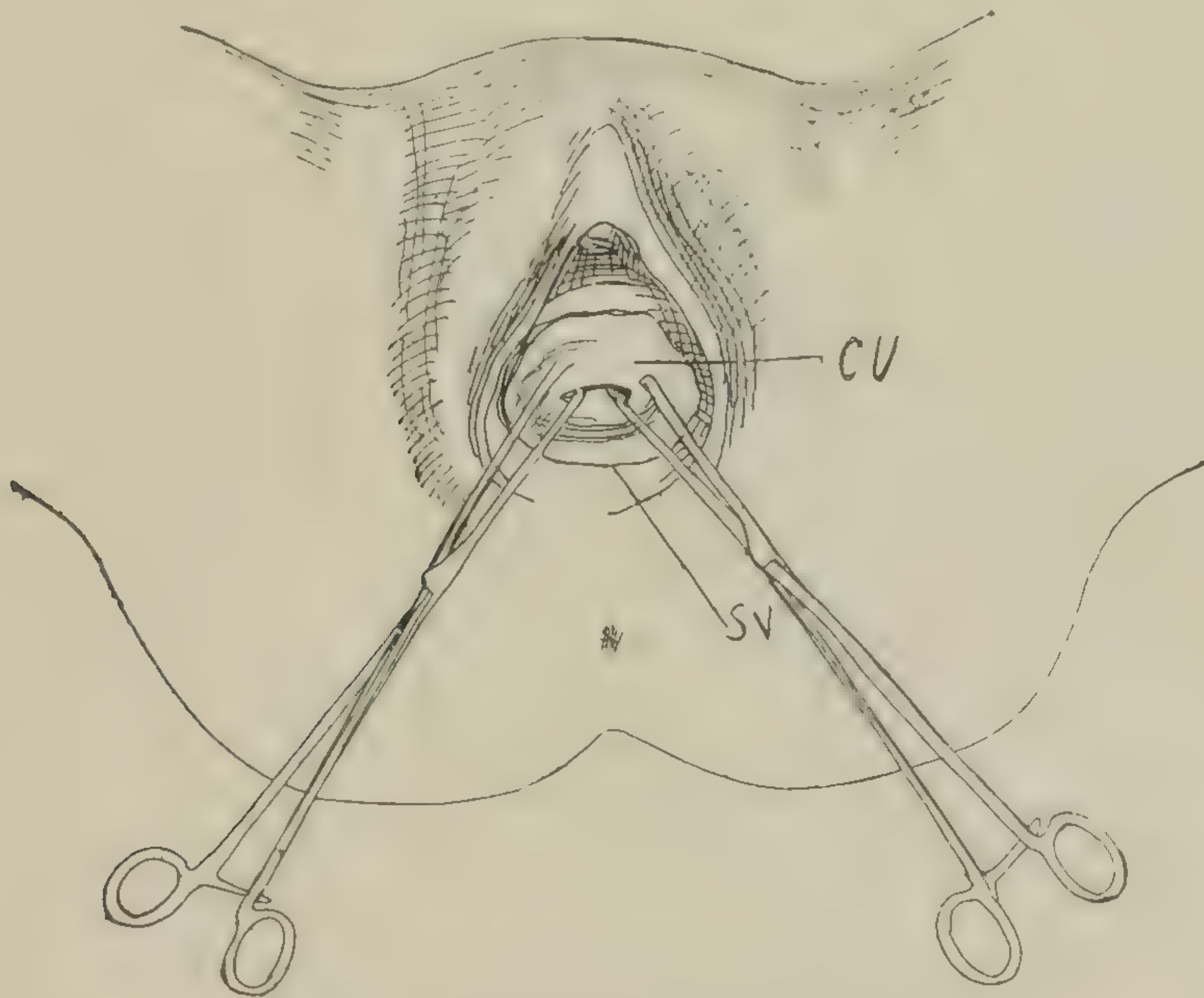


FIG. 88. The circular incision around the cervix.

incision is made just below the vaginal attachment. With the aid of the finger (Fig. 89) or curved scissors the tissues are pushed forward until the uterine artery is nearly reached. The tissues are then separated in front and behind this artery, and the artery



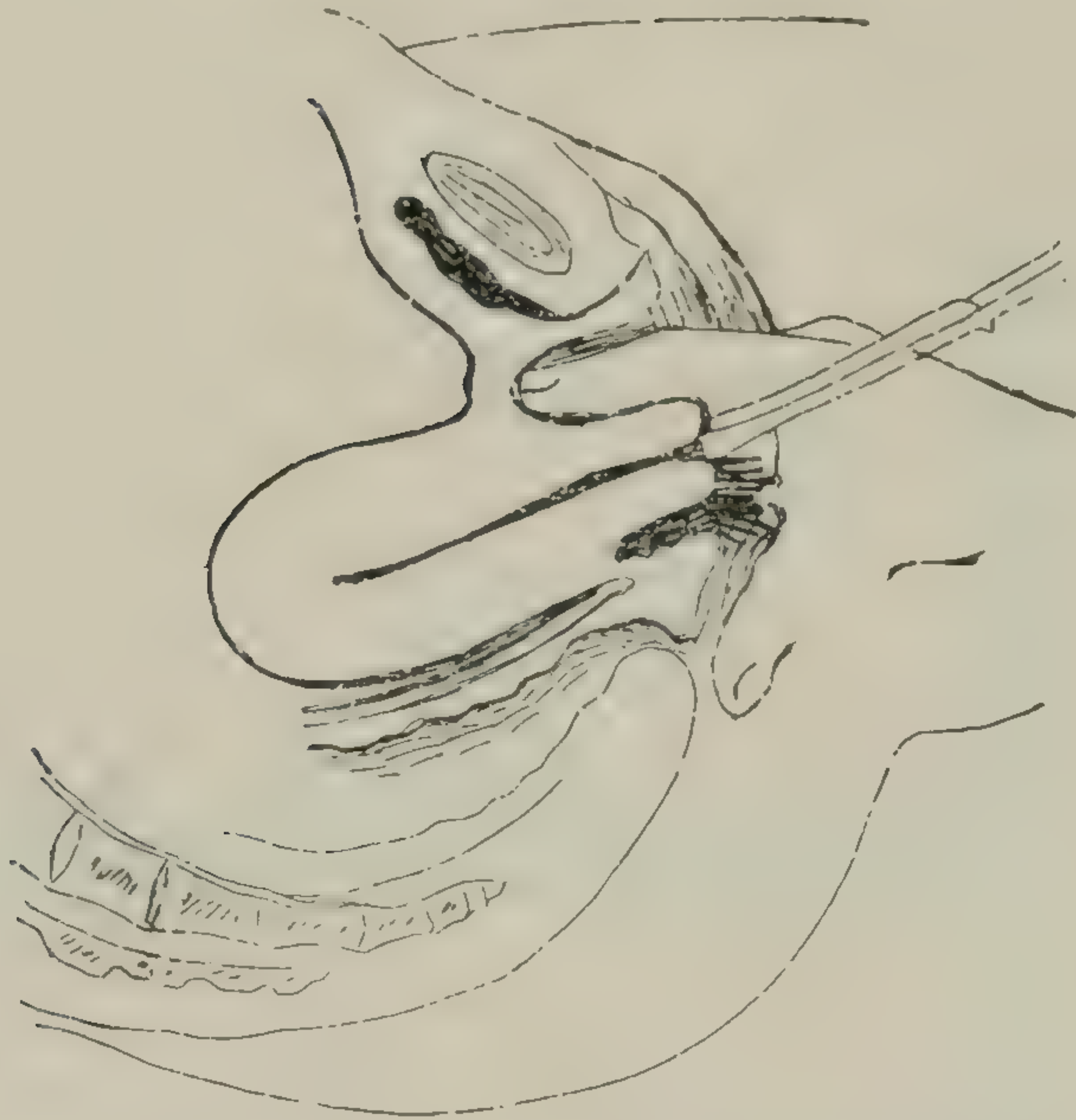


FIG. 89. Finger pushing back the tissues so as to separate the base of the broad ligament containing the uterine artery.

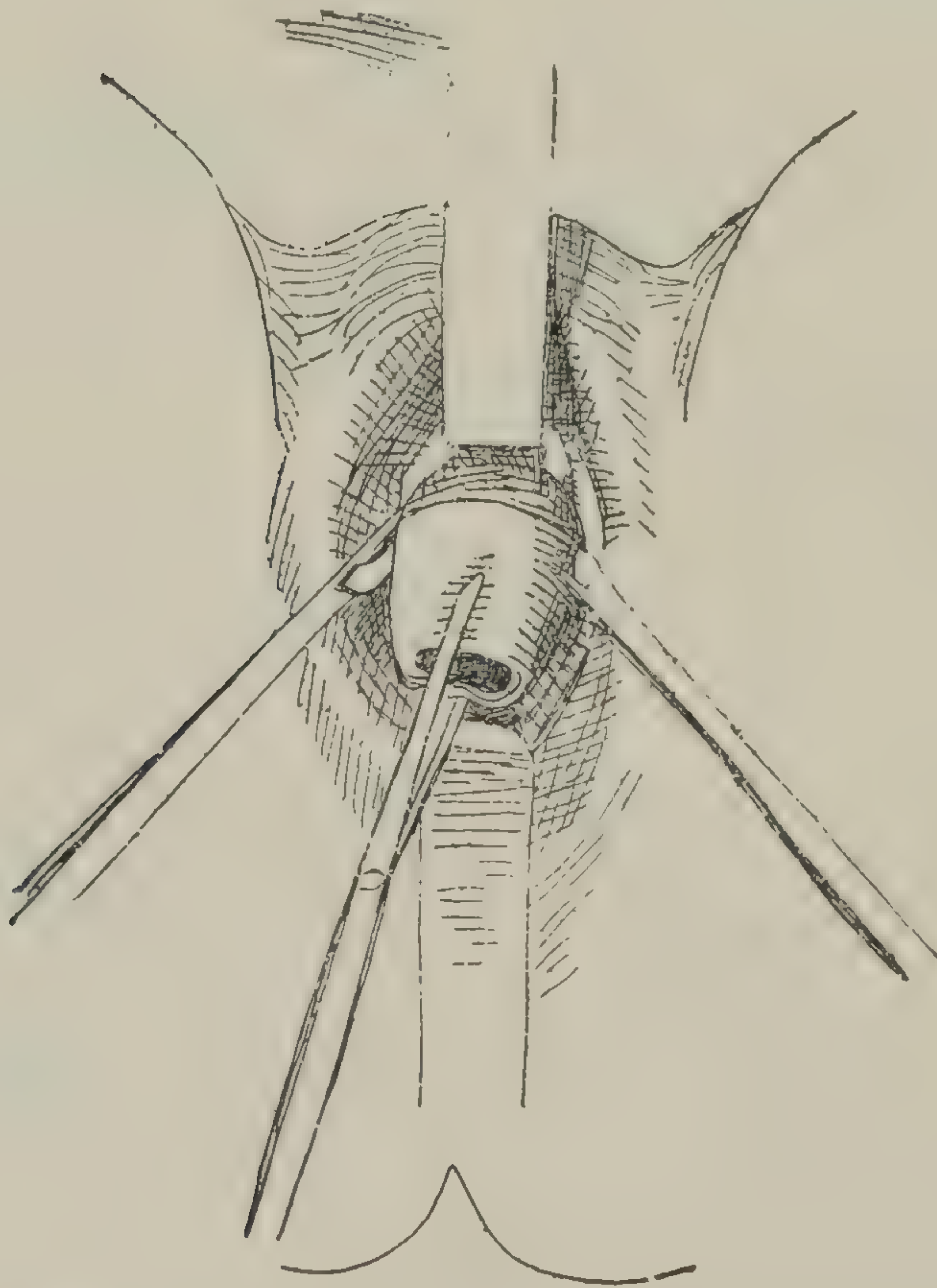


FIG. 90. Uterine artery seized with hemostatic forceps.



itself seized with strong hemostatic forceps (Fig. 90). Each artery being thus seized, the tissues between the forceps and cervix are cut with scissors. The point of the forceps should be directed towards the uterus rather than away from it, so as to avoid the ureter. The tissues embracing the uterine arteries having been severed, the separation is continued anteriorly and posteriorly until the peritoneal cavity is reached. With the anterior valve the assistant aids, both by protecting the bladder and by holding back the tissues, as separated by the scissors or finger of the operator. If, owing to the presence of adhesions, or owing to its large size, the uterus cannot be drawn down and the fundus drawn forward readily, the uterus should be split through its an-

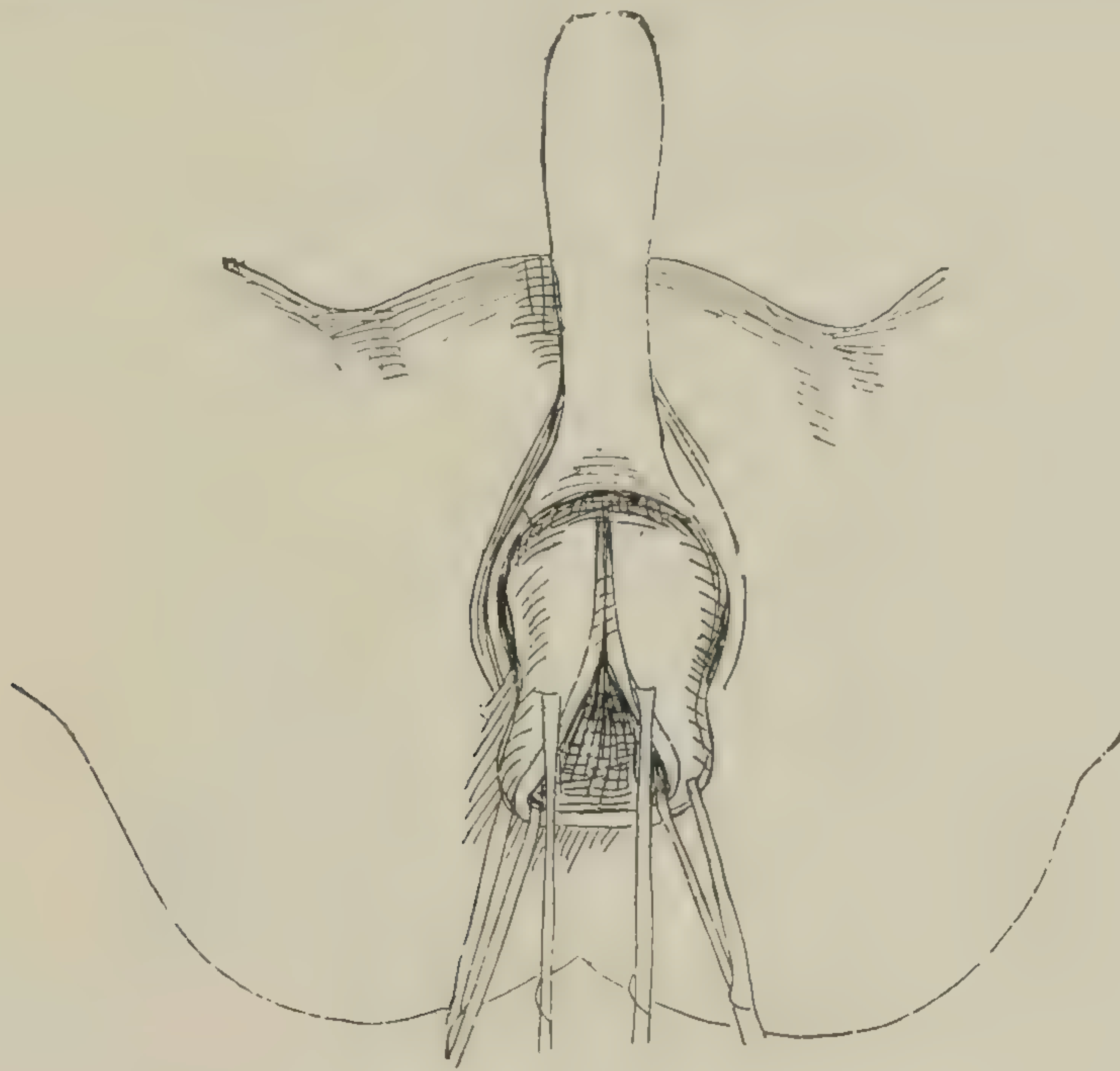


FIG. 91. Splitting of the anterior uterine wall.

terior wall from below upward (Fig. 91). In this case two five-toothed forceps are fixed in the cervix and the cervix split between them. By then seizing the uterus on each side of this line of splitting by other forceps, it can be drawn down a little at a time and split higher up, so that, by alternate splitting and pulling down, the entire anterior wall will be split. By still continuing the traction with the forceps, or by the introduction of an Aubeau



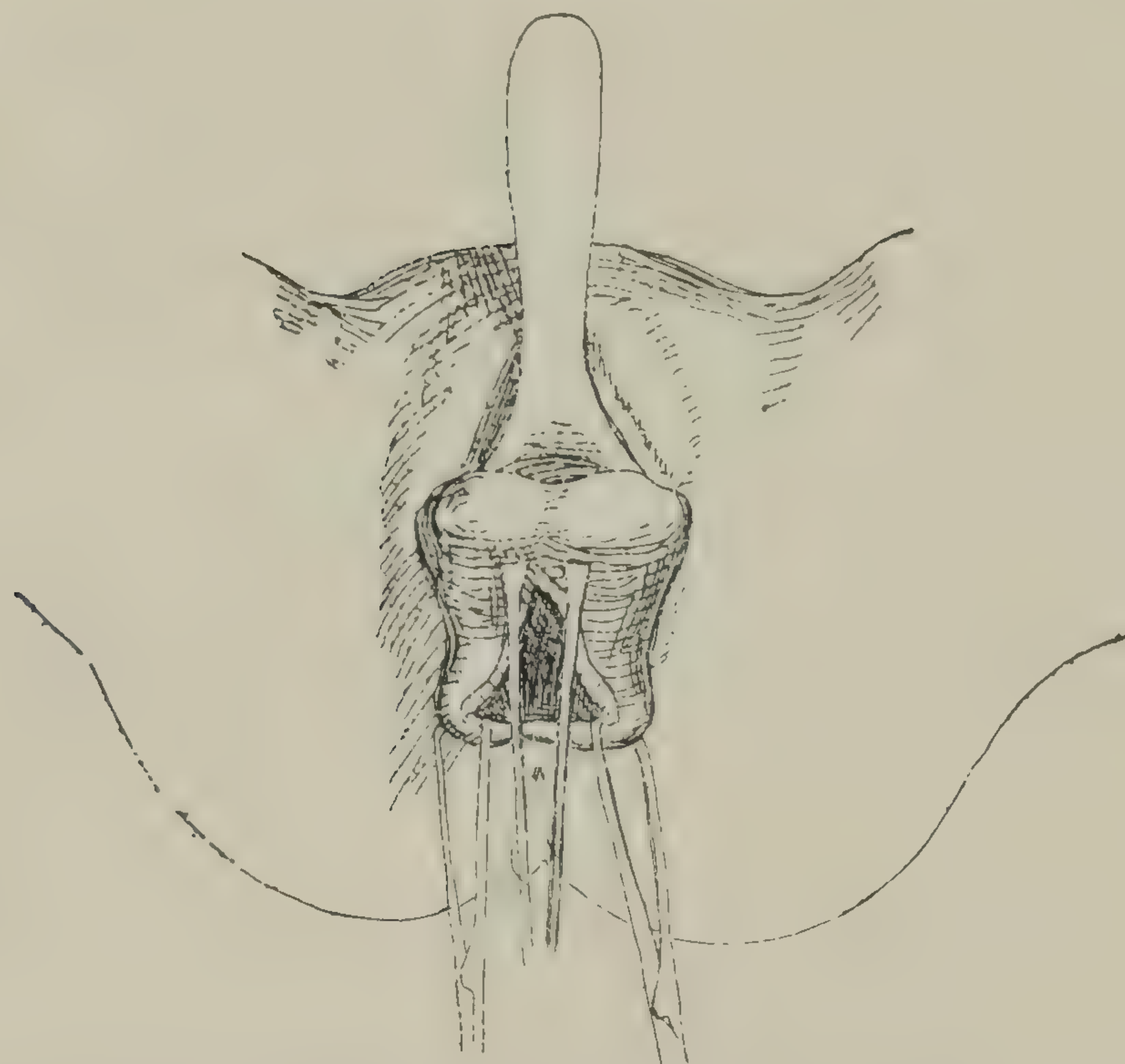


FIG. 92. Fundus of uterus drawn down through the vulva.

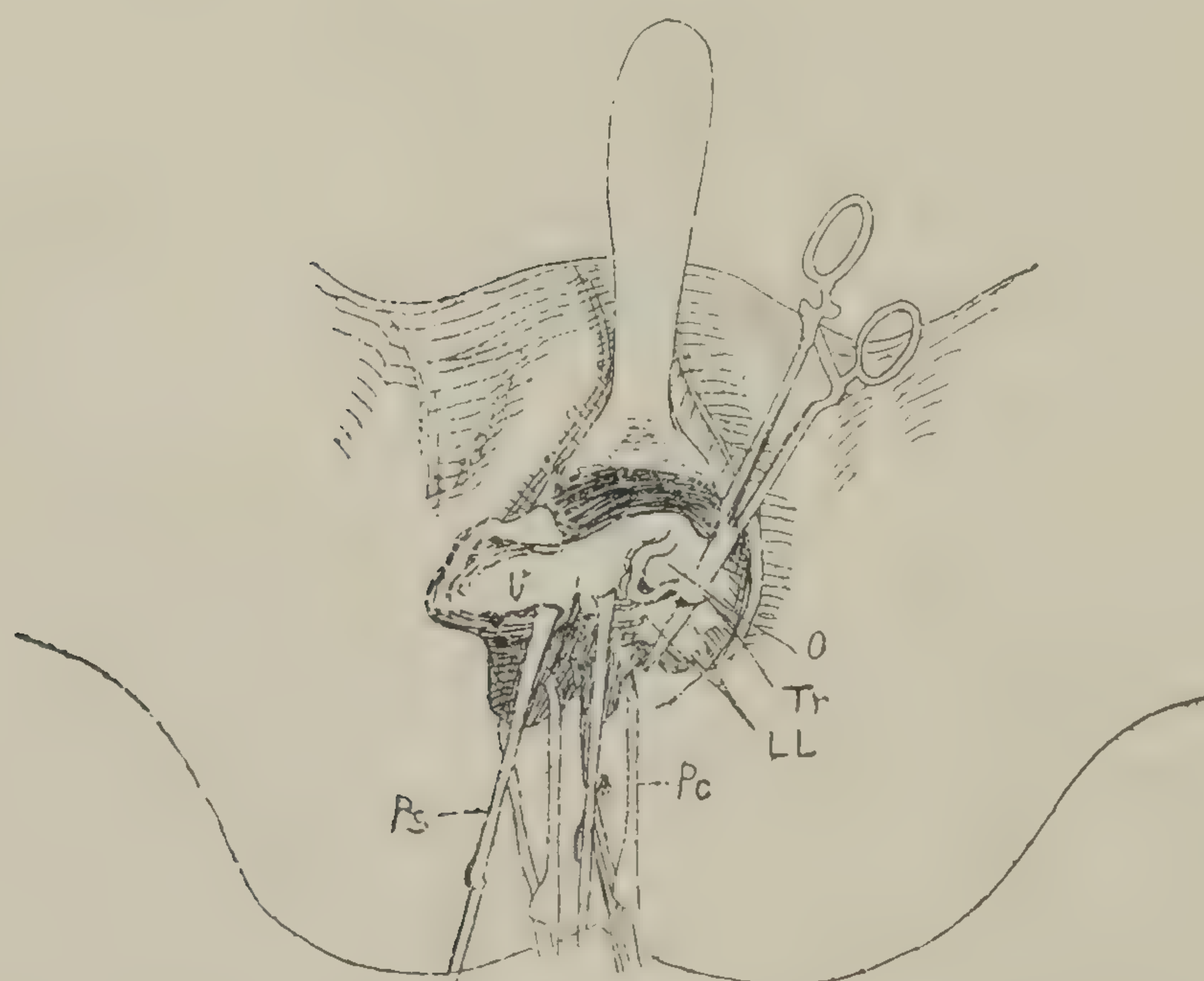


FIG. 93. Application of clamp from above. Clamp on uterine artery is not here shown.



hook, the fundus is anteflexed and drawn down to, or through, the vulva (Fig. 92). This maneuver twists upon itself the broad ligaments so that the upper border of each is now below. A long clamp is next placed upon the broad ligament on each side, the point of this clamp, if possible, being passed down (Fig. 93) so as to meet, or slightly pass, the first clamp introduced, the one controlling the uterine artery; this being done the broad ligament is severed upon each side and the uterus removed. In case the forceps cannot be made to embrace the entire broad ligament, the upper portion is seized and severed, and then, as more room is

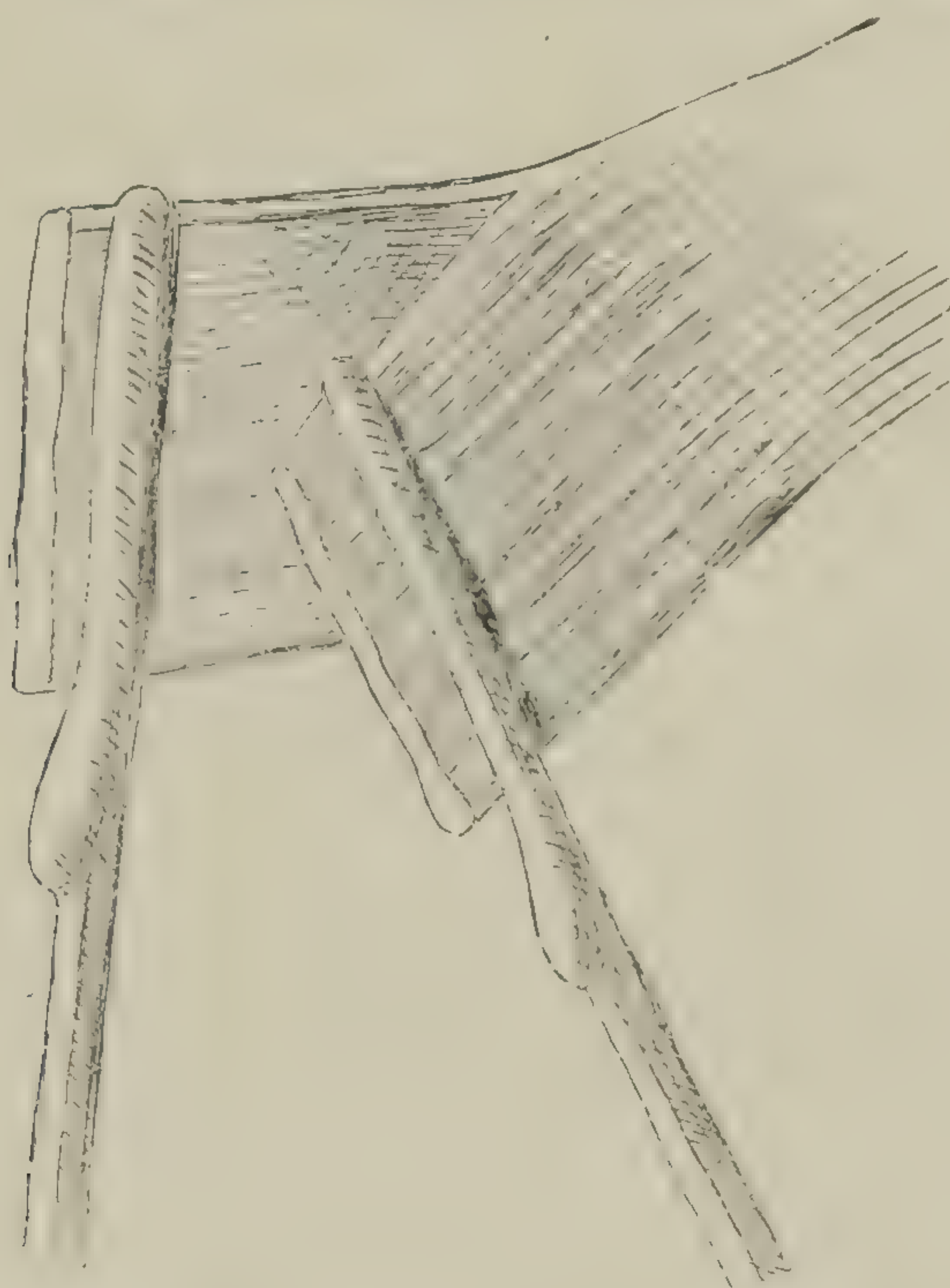


FIG. 94. Showing splitting of broad ligament, with resulting risk of hemorrhage, in case the forceps do not pass each other.

secured, the central portion is caught in a second forceps. In case the uterus is too firmly fixed or too much elongated to permit the operator to antevert it, the cervix is amputated so as to gain more room. The portion of the body just above the amputated cervix may be seized, separated from its attachments and removed with curved scissors, and thus the entire lower portion of the organ may be removed. In applying the clamps to the broad ligaments the ovary should, if possible, be brought down



so that the clamp is applied on the outside of it; but this can be done better sometimes after the removal of the uterus, when there is more room for manipulation. If, however, the ovary cannot be readily reached, or if firmly adherent, it can be left, as it is found to soon atrophy and give no trouble. It is important, while drawing down the uterus with volsellum forceps, not to let go with one pair of forceps until another pair has been properly placed. In case the forceps cannot be satisfactorily placed upon the broad ligament, the posterior wall of the uterus can, after the organ is anteverted, be split so that each half can, by itself, be drawn down and the forceps applied. If this section is made in the median line there will be no hemorrhage. After removing the uterus it may be found that there is quite a little bleeding from that portion of the vaginal wall corresponding to Douglas's cul-de-sac. The bleeding is at once controlled by the application of a few straight forceps. The bases of the broad ligaments should be carefully examined, and forceps applied to bleeding points. It is regarded as of prime importance to check all bleeding, both in order to save the blood of the patient and also to avoid saturation of the dressings and the production in this way of a fertile field for bacterial development. Bleeding having been controlled, pledgets of iodoform gauze, to which cords are attached, or strips of iodoform gauze, should be packed into the vault of the vagina, passing up a little into the pelvis, so as to assure drainage. These strips should be packed between and around the forceps, the packing being continued until the entire vagina is filled with the gauze. A sterilized catheter is then introduced into the bladder and a T bandage applied to keep the dressings in place. Forty-eight hours afterward, without disturbing the packing, the forceps are one at a time detached and withdrawn. The packing should be left in place six or seven days. It can then be removed and douches carefully used twice a day until convalescence is complete.

In case abscesses or pus tubes are encountered, these are freely opened, cleansed and packed with gauze, the operation being



completed as above described. It is necessary, however, in such cases to renew the packing after its first removal to insure healing of the abscess cavities, or pus tubes, from the bottom.

The patient can usually be allowed to sit up in two weeks, and convalescence is rapidly established.

In the removal of the uterus containing fibroids the same manipulations in general are resorted to as have been before de-

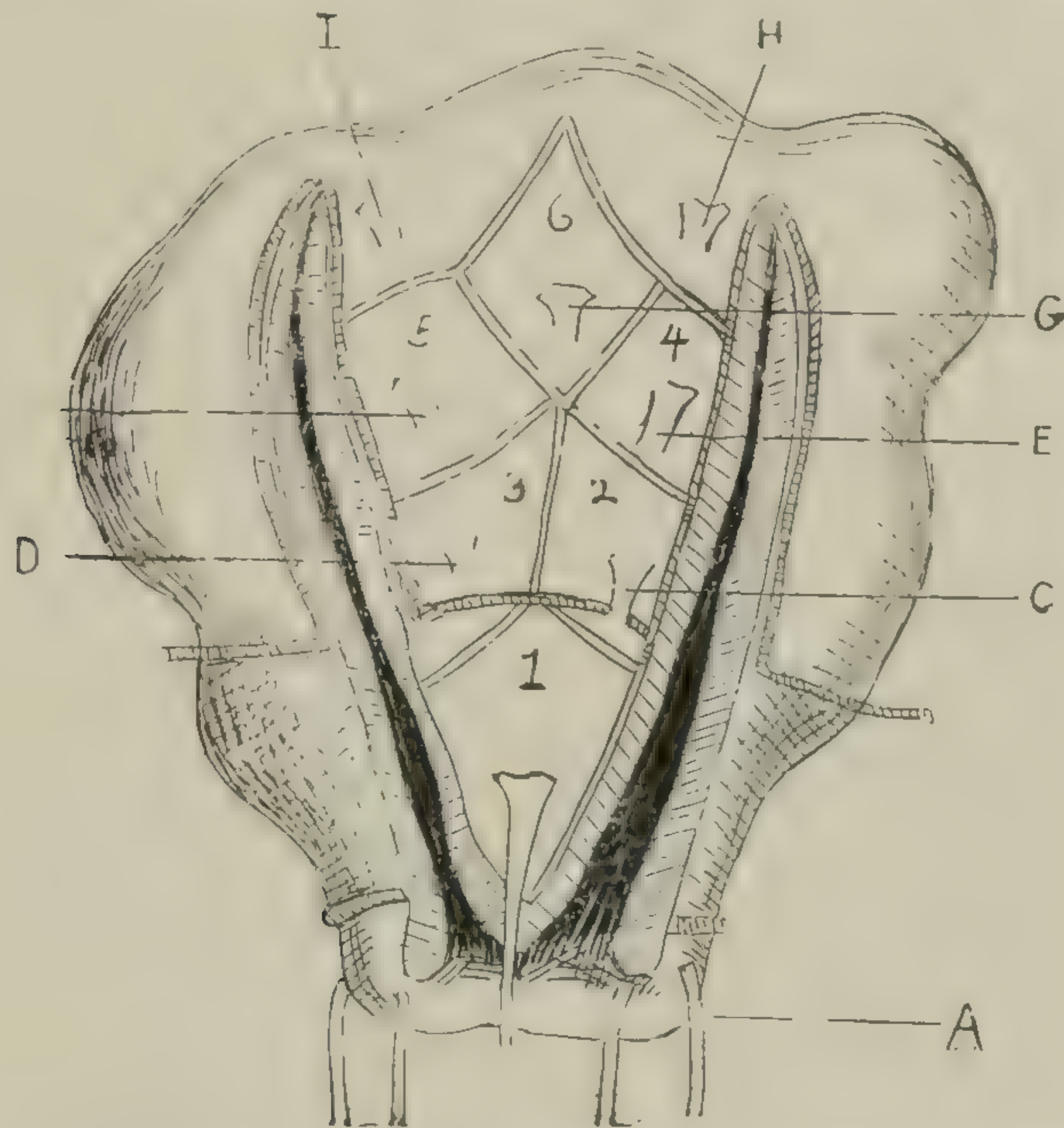


FIG. 95. Method of hysterectomy by morcellation.

scribed. The uterus is split up by perhaps two lines (Fig. 95) diverging towards each horn. As uterine or fibroid tissue presents itself it is seized with forceps and cut off with strong curved scissors. Little by little the uterus is thus reduced in size until what is left can be drawn down and out of the vulva, as in the non-fibroid operation.

The above technique of abdominal hysterectomy may sometimes be advantageously modified, as proposed by Landau.\* In this method the cervix is exposed and fixed, and a circular incision made with scissors (Fig. 96), as above described. This circular incision being made, the tissues are separated with the finger or scissors, this separation being carried up chiefly in front. If at any time more room is needed, a longitudinal incision can be

\* The Vaginal Radical Operation. Wm. Wood & Co. 1897.



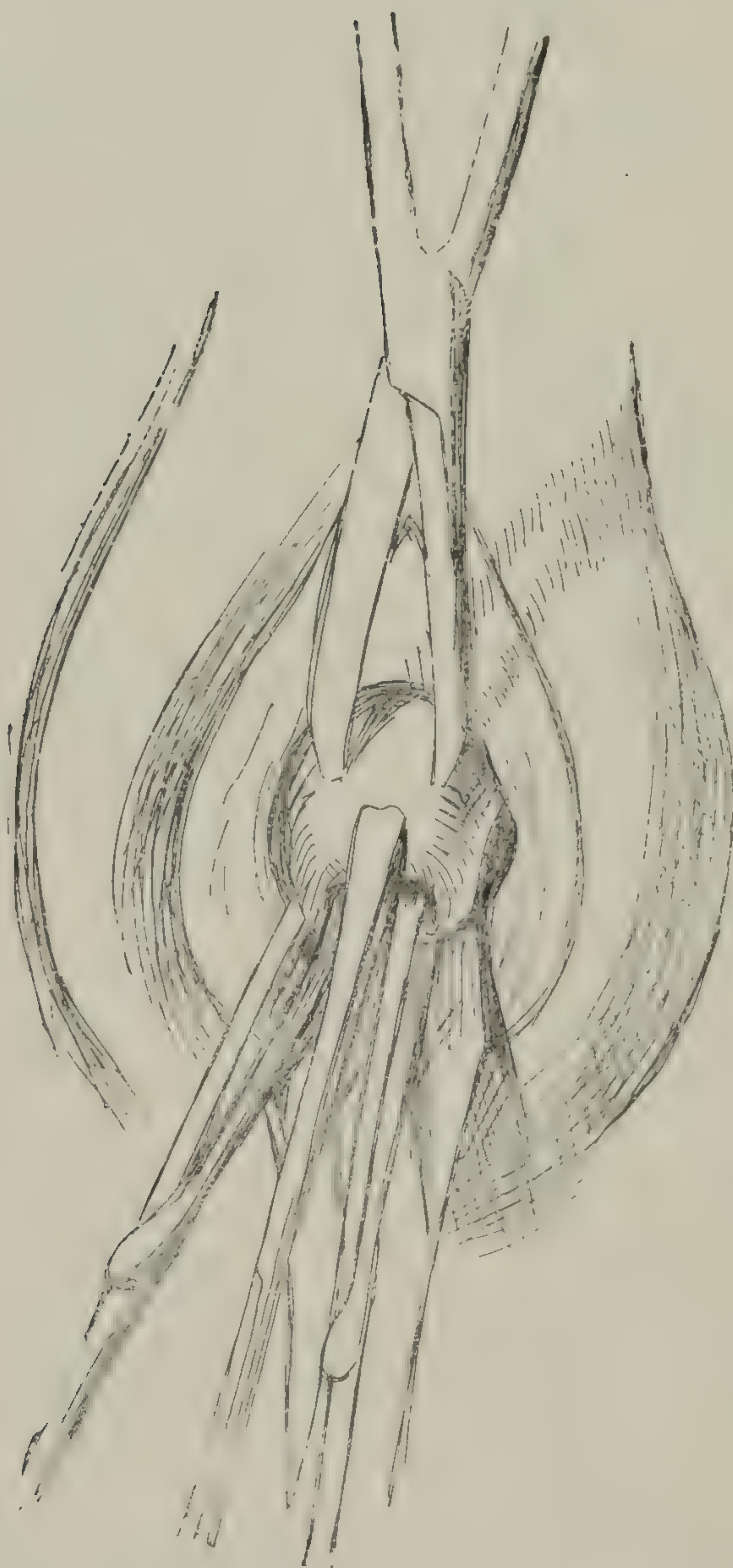


FIG. 96. Commencing circular incision with scissors.



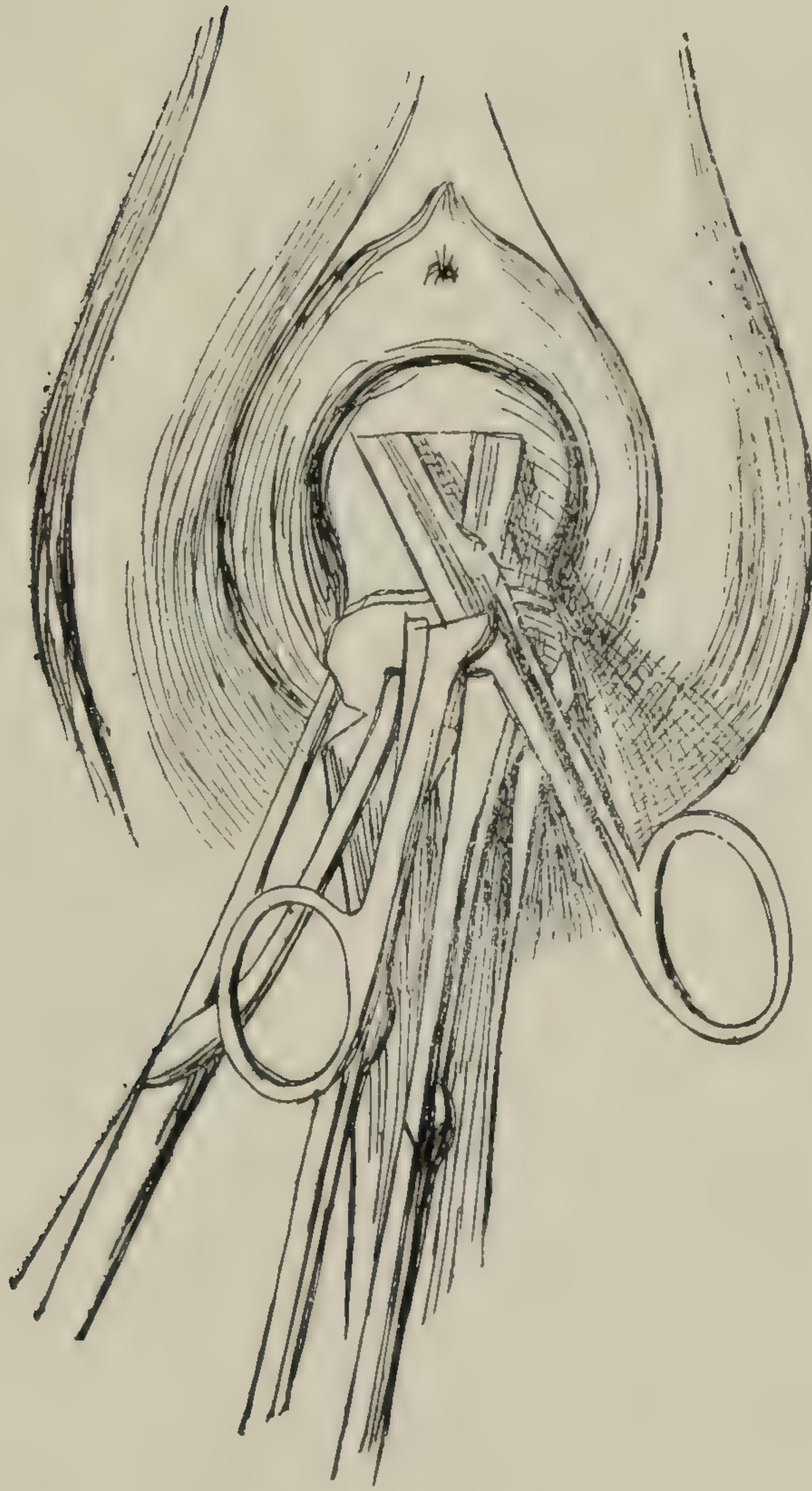


FIG. 97. Introduction of scissors and tearing through the utero-vesical pouch.



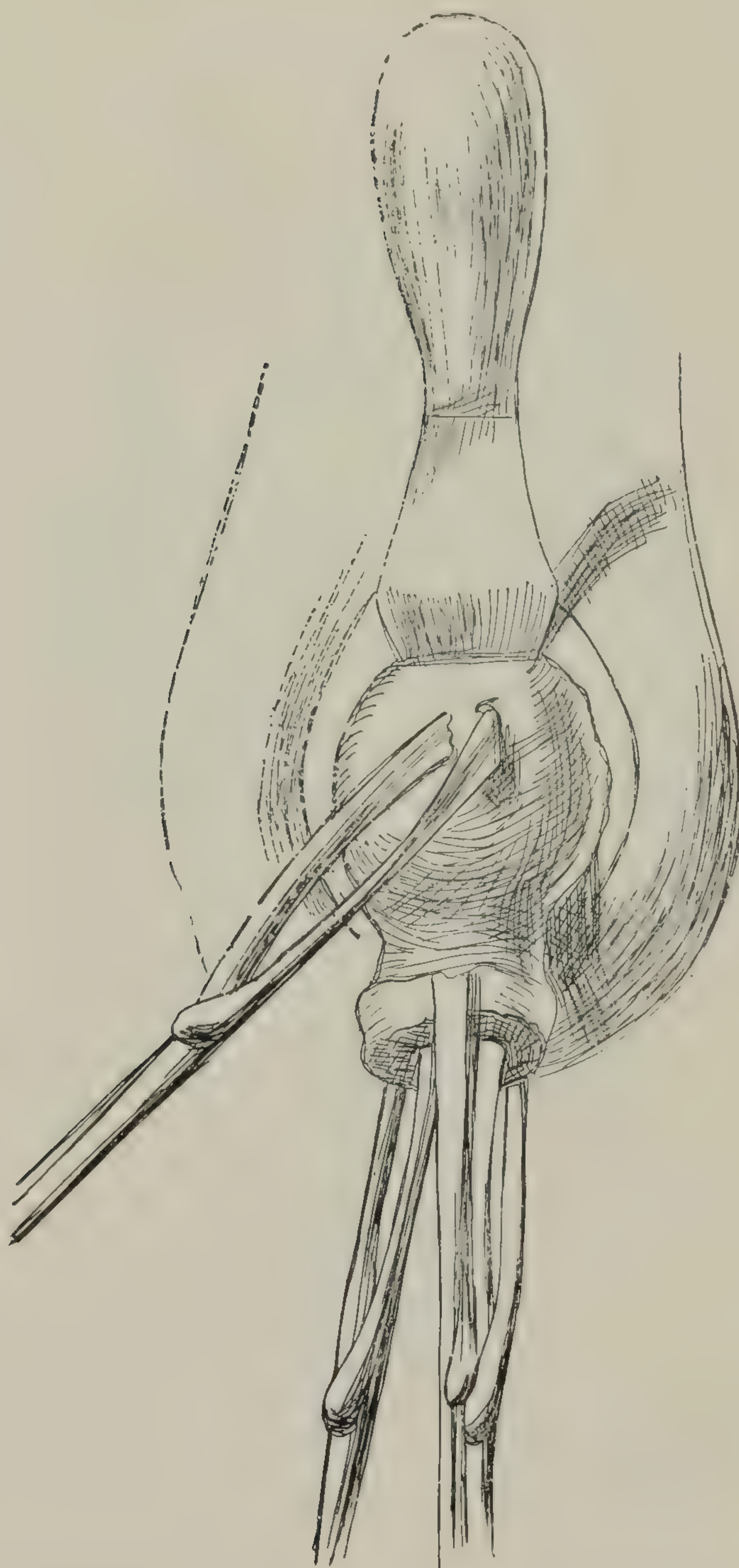


FIG. 98. Bringing the fundus forward, after introduction of retractor to protect bladder and ureters.



made toward the bladder. The uterus being now well drawn down, the peritoneal cavity is opened by the introduction of scissors and the separation of the blades. (Fig. 97.) A retractor is then passed through the opening between the bladder and the uterus, and the fundus drawn forward as shown in Fig. 98. This retractor serves to lift up out of harm's way the base of the bladder, carrying with it the ureters. The body of the uterus being

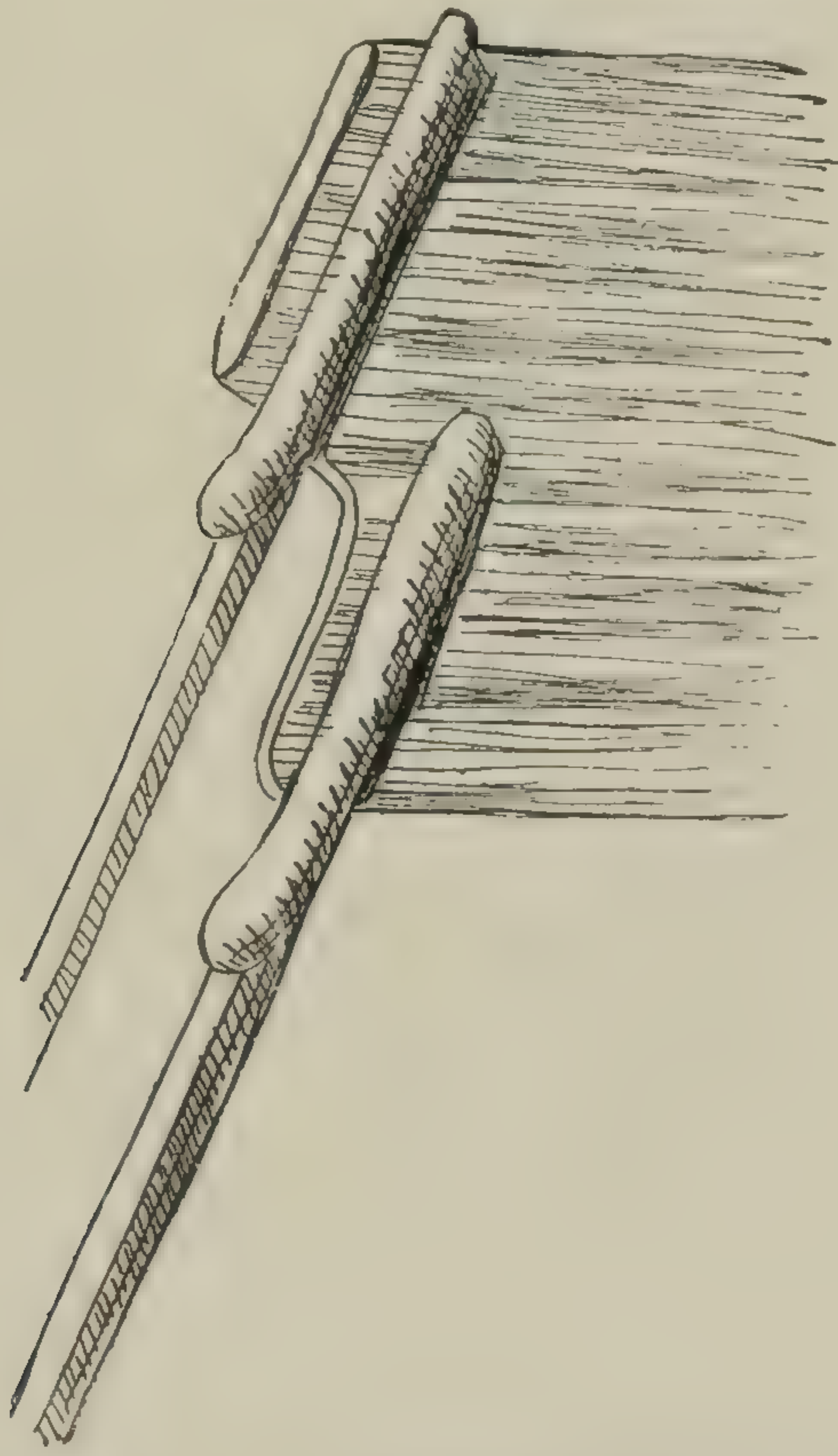


FIG. 99. Showing application of clamps from below upward. Sometimes a single clamp will suffice ; occasionally more than two will be required.

thus drawn forward, the appendages are freed with the fingers from any adhesions and drawn out of the vulva. By next passing a finger up behind the cervix, and another down behind the fundus, the fingers approach each other, being separated by the peritoneo-vaginal tissues in Douglas's cul-de-sac. These tissues are torn through by a forceps passed down, guarded by the fingers already introduced. This opening is enlarged by tearing or cutting, so that the uterus is attached merely by the tissues of the



broad ligaments. These tissues are now clamped upon each side, preferably from below upward. (Fig. 99.) The clamps having been applied the tissues between the clamps and uterus are sev-

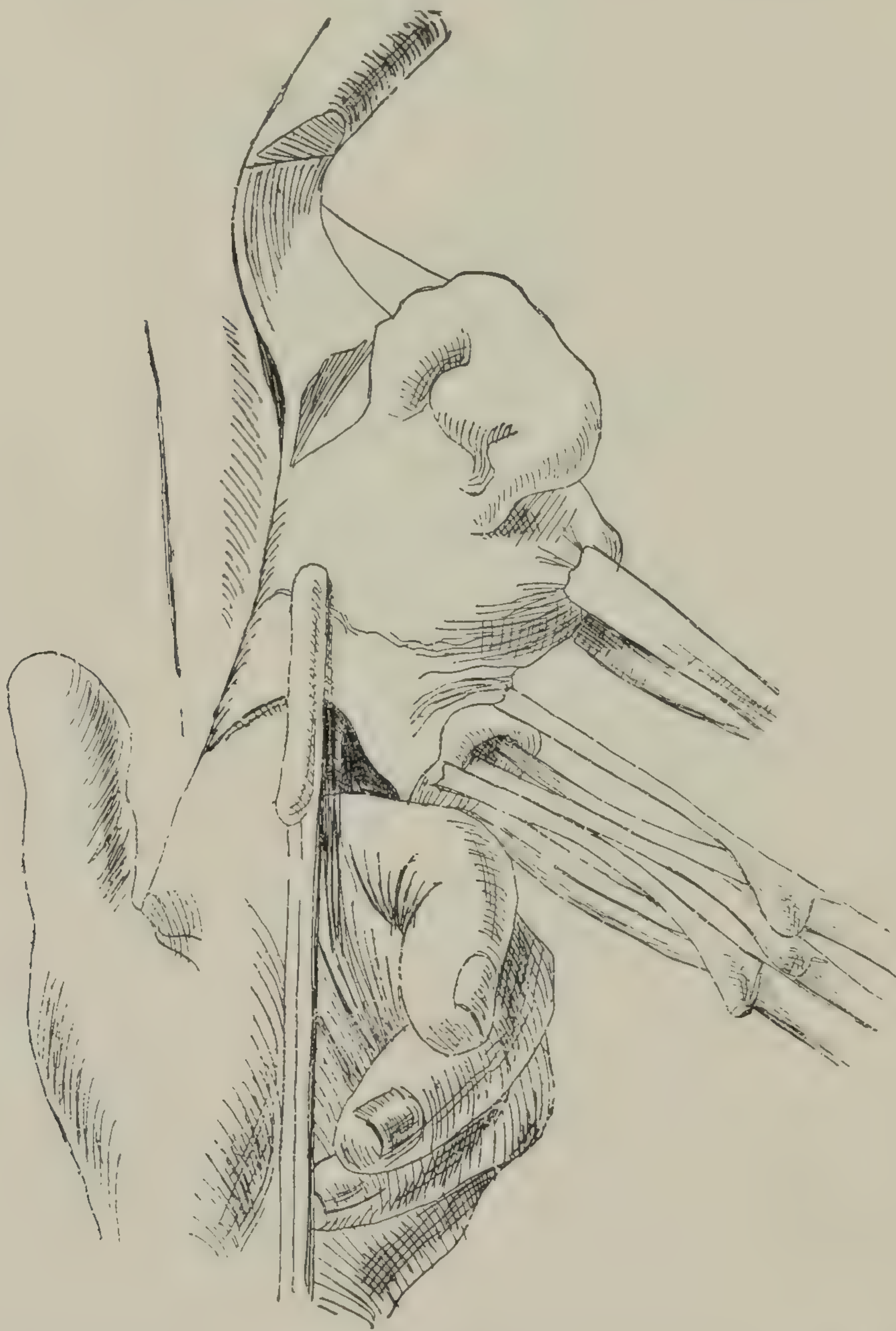


FIG 100. Application of clamp on the right side, the application being guarded by the fore finger.

ered with scissors and the organ removed. (Fig. 100.) The field of operation is carefully examined to see that all bleeding is stopped, and then gauze introduced as in the method first described.



It is sometimes well to narrow somewhat the opening in the vaginal vault by the introduction of a few catgut sutures.

In case the uterus is too large to be delivered whole, or in case the adnexa are too firmly adherent to permit of its being thus delivered, it should be split in the median line and each half drawn

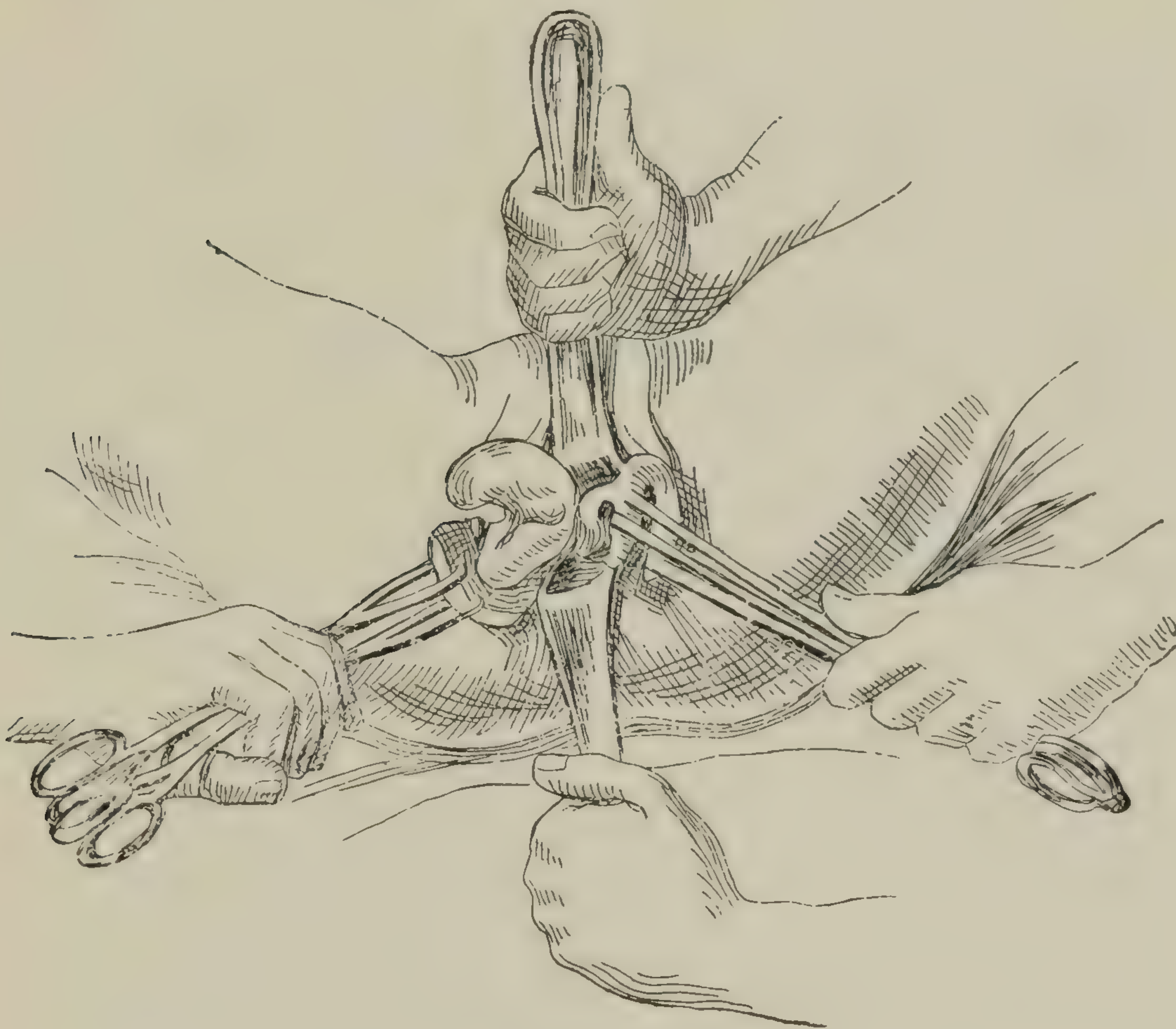


FIG. 101. Drawing down of each half of the uterus with the appendages.

down separately. (Fig. 101.) This gives better control of the part and furnishes more room for manipulation.

In vaginal hysterectomy by the clamp method it is important to have clamps with very strong blades, so that there may be no slipping after their being once applied. Curved clamps possess no advantage over the straight ones, while their removal is more difficult, but it is well to have at hand different lengths of clamps. (Fig. 102.)



BY LIGATURES. The preliminary treatment and initial incision are the same in making a hysterectomy by the use of ligatures as by the use of clamps. After the incision of the vaginal mucous membrane and pushing it away so as to expose the base of each broad ligament, a ligature is introduced, either by means of a curved needle and needle forceps or a handled hook (Fig.

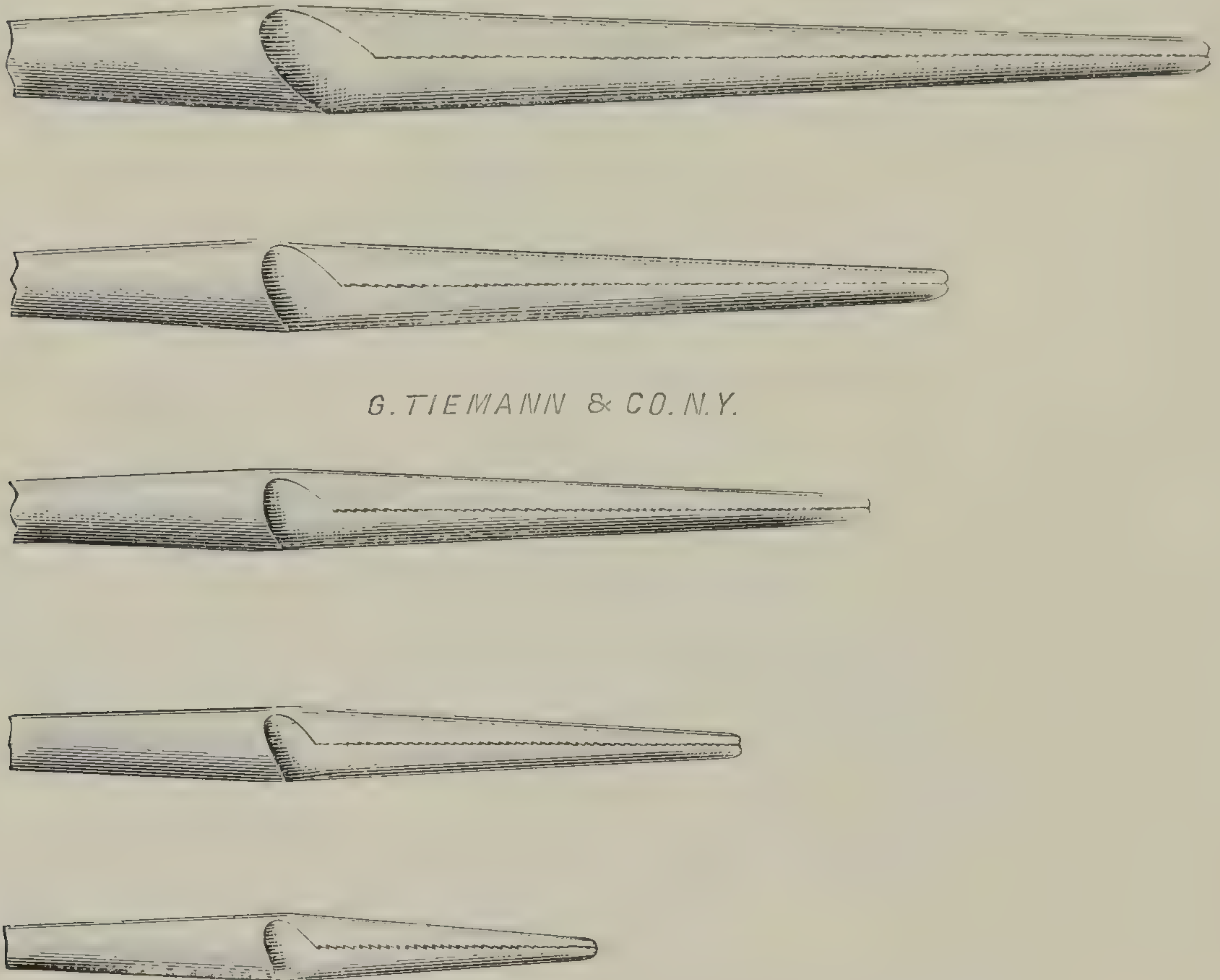


FIG. 102. Different sizes of clamps for vaginal hysterectomy.

16), close to the uterus and introduced so deeply as to embrace the uterine artery. Before tying, the ligature can be pushed away from the uterus carrying with it the ureter, so that it may be tied safely at a distance of about one-half inch from the cervix. The ligature having been firmly tied the intervening tissue between the ligature and the uterus is cut with scissors. A similar ligature is then passed upon the opposite side and all the tissues severed. By thus cutting the base of each broad ligament the uterus is more moveable and can be drawn down lower than before.



Being thus drawn down and to one side, more of the tissue of the broad ligament is caught and ligated, first upon one side and then on the other, with severing of the intervening tissue at each step of the ligation. The uterus can finally be pulled down so that the last ligature upon each side can be carried above the border of the broad ligament and the uterus separated under the guidance of the eye, the point of the scissors being guarded by the finger hooked over the border of the broad ligament. Three or four ligatures will be thus used on each side. The uterus being out of the way the tube and ovary on each side can be drawn down for examination, and if removal is desirable a ligature is placed upon the outside of the ovary and the appendages removed. All bleeding points having been ligated, and the field of operation cleansed, the peritoneum anteriorly and posteriorly is lightly brought together with fine silk or catgut, so as partially to shut off the pelvis from the vagina. Gauze is then packed in below the peritoneum so as to provide for protection and drainage, and the operation completed by continuing the packing to the vulva and fastening a catheter into the bladder.

The gauze packing is removed at the end of about six days, and at this time with a good light and with care some of the ligatures may be safely removed with sharp pointed scissors. Usually, however, it will be found very difficult to remove the deeper ligatures, and these must be allowed to come away of themselves a number of days or several weeks later. One of the chief objections to this method of operating is the fact that the woman does not regard herself as entirely over the operation until the ligatures have come away, and there is sometimes great delay in their separation and discharge. To remove them by manual interference is always a painful process, and one difficult if not sometimes impossible of performance. A number of devices have been brought forward to overcome the difficulty experienced in removing these ligatures,, but the trend of professional sentiment seems to be in favor of the abandonment of the ligatures in favor of the clamp, and by this means obviating the entire trouble.



Three or four ligatures will usually be necessary upon each side. If there is much oozing from the cut surface in Douglas's cul-de-sac, this may be checked by the introduction of a running catgut suture by which the mucous and peritoneal edges are whipped together.



## CHAPTER XIX.

### UTERINE CANCER.

**I**N this chapter the word cancer will be used as covering all forms of malignant growth.

**ETIOLOGY.** While, in a large number of cases of cancer of the uterus, no cause can be assigned for its appearance in this locality, nevertheless here as elsewhere local irritation will be found, in a large majority of the cases, as an antecedent factor. Usually this source of irritation will be a neglected laceration of the cervix.

The disease is most frequently found in patients between forty and fifty years of age, or upwards. It may, however, appear much earlier. Cases have been reported as early as nine years of age. I have seen two cases in which the disease appeared in the twenty-sixth year. One patient was a married woman who had never been pregnant. The other was an unmarried girl. In neither was there anything found in the history to account for the appearance of the disease. One case was inoperable when first seen; in the other a vaginal hysterectomy gave temporary relief, but there was prompt recurrence with death.

**DIAGNOSIS.** The onset of the disease is insidious, so that it is frequently far advanced before the patient notices anything which leads her to consult a physician. Among the earliest symptoms are usually slight irregular hemorrhages and a watery discharge, which may or may not be offensive. These early discharges do not come from an ulcerated surface, but as the result of the metritis. At this stage of the disease the patient usually complains of such symptoms as ordinarily accompany metritis and hyperplasia. When she finally consults a physician it will be found that the disease has progressed until, if the cervix is the part affected, this will have become decidedly hard or the site of a papillary growth or of an ulcerated excavation. The ulcera-



tions, when seen through a speculum, have a yellowish surface, while the non-ulcerated parts frequently present a brilliant granular aspect. In some cases the vagina will be found entirely filled with fungous vegetations, from which there is a profuse and offensive ichorous discharge, of so acrid a character as to cause vaginitis, and even erythema of the thighs. If the cancer involves the fundus, the os will be usually patulous, with a free discharge more or less tinged with blood and of an offensive character. The fundus will be found enlarged and frequently nodular, with or without adhesions to neighboring organs; these adhesions, if occurring early, being probably inflammatory in character, but if occurring late more frequently due to extension of the disease. The speculum is of very little value in making the diagnosis of cancer. The educated finger is more to be depended upon. In many cases the speculum will show very little apparent involvement of the cervix, and yet on making a digital examination extensive disease may be quickly detected.

A very marked characteristic of malignant new growths is their friability. If it is found that the projecting growth can be broken off with the finger, it may be quite positively stated that the disease is malignant in character.

PAIN, while the usual accompaniment of cancer, is sometimes notably absent, and we occasionally see cases progressing steadily to a fatal termination with at no time any special complaint of pain. I have even seen the cancer involve the entire vagina, the rectum and bladder, the latter being perforated, without there being at any time any manifestation of pain or any acknowledgement of its existence.

SARCOMA of the fundus may sometimes closely simulate fibroid, but the patient, in case of fibroids, is usually younger, the disease is of slower progress and usually not painful until the bulk becomes so great as to produce pressure. Symptoms of the presence of a tumor simulating fibroid, in a woman past forty years of age, of rapid growth and painful, should at once excite suspicion of malignancy. In such cases the cervix should be



dilated until the finger can be introduced to the fundus. By this means a positive diagnosis may generally be made.

In cases of doubt, scrapings removed from the interior when examined microscopically may occasionally enable a diagnosis to be reached, but if the cervix be the part involved, it is much better to remove a wedge-shaped section of the growth for such examination.

It is doubtless the experience of every gynecologist to have been called more than once to see cases of *sloughing fibroids*, in which, from the emaciation, cachexia, hemorrhages, and offensive discharge, a diagnosis of cancer had been made. Careful investigation will almost invariably establish a diagnosis. The character of the growth, if fibroid, is very different from that of cancer.

Extensive *laceration of the cervix*, with its accompanying eversion, erosion and hyperplasia, is most apt to be mistaken for cancer, and in some of these cases diagnosis is only possible after microscopic examination. It is in such cases that a wedge of tissue should be removed for the microscopist; but in all these cases it is well to keep in mind the suggestion of Pozzi, that where the nature of these is uncertain, it is not cancer.

Cases of *senile endometritis* are occasionally met with which present many of the symptoms of cancer. There is usually more or less stenosis of the cervix, so that there is a retention of mucus within the uterine cavity. This results sometimes in quite a distinct enlargement of that organ, while the discharge is very apt to be offensive. Dilating the cervix for purposes of examination will give exit to this accumulation, and the use of the curette followed by stimulating applications locally results in a prompt cure.

In the early stage of cancer of the cervix, the cancerous nodule may feel very much like a *small myoma*, but it must be remembered that the mucous membrane is not adherent to the fibroma, while it is involved in the cancerous nodule.



PROGNOSIS. Patients with this disease usually live about eighteen months after a diagnosis has been made. In young patients the disease usually progresses more rapidly than in the old. Sarcoma usually progresses more slowly than carcinoma.

TREATMENT. This is radical and palliative. A few years ago treatment of cancer of the cervix was limited to amputation, while treatment of the disease of the body was only palliative. Following the ordinary amputation of the cervix came high amputation, but with the introduction of hysterectomy, and the perfection of its technique, the mortality of the latter operation has become so reduced as to be practically no greater than that of high amputation, while the prognosis is infinitely better. At the present time, therefore, the radical treatment of uterine cancer is by hysterectomy, either vaginal, abdominal, or combined.

The technique of hysterectomy for cancer does not differ from that of the operation for other conditions, except that if possible greater thoroughness is required in asepsis. The fungous growth, if any exists, should be removed with scissors or sharp curette, and the surface cauterized with a Paquelin cautery. This must be done under an anesthetic, and can be done as a mere preliminary step of the operation, or an interval of three or four days may occur between the two. In addition to the increase in asepsis, special care should be taken to remove as much tissue as possible. It is for this reason that abdominal hysterectomy, or the combined method, possesses advantages over the operation through the vagina. The broad ligaments may be more widely removed, and enlarged retro-peritoneal glands eradicated. By the introduction of the ureteral bougie, by which the operator is enabled to identify and avoid the ureters, it is possible to dissect out suspicious tissue far and wide of the more patent manifestations of the disease.

In the combined method the operator first separates the cervix, with as much vaginal tissue as he desires, through the vagina, occluding the uterine arteries with clamps or ligatures. Hemorrhage being thus controlled from the vagina, the abdomen



is opened and the appendages, including the broad ligaments, widely removed, with or without the removal of retro-peritoneal glands as may be necessary.

When the disease, however, has advanced so far as to involve the broad ligaments, and especially the retro-peritoneal glands, it is very doubtful if any advantage is gained by a wide dissection of the diseased parts. The more extensive the dissection the greater the immediate risk of the operation, and it is questionable if the ultimate results are such as to justify the increased hazard.

OPERATIVE PROGNOSIS. The immediate mortality of hysterectomy for cancer should not exceed five per cent. As to the ultimate results, however, statistics of different operators differ so widely as to render any expression of opinion of very little value. The statistics of some operators, indeed, are so favorable as to lead the unbiased reader to the inevitable conclusion that they are the result of many errors in diagnosis, and that many of the cases of so-called cancer have been merely those of cervical hyperplasia with erosion.

KRASKE'S OPERATION. In this the patient is placed in the right lateral decubitus and an incision made extending from the point of the coccyx along its side for about four inches, curving outward to end at the middle of the sacro-iliac symphysis. Through this incision the coccyx is removed and the lower portion of the sacrum below its third foramen. The rectum is then pushed to one side and the peritoneum opened. Although this operation gives a large opening for the removal of the malignant growth, it is questionable whether the operation, instead of being a surgical triumph, is not rather a surgical atrocity, whose advantages are far outweighed by its inherent dangers.

ELECTRICITY has been used in the form of the cautery for the destruction of these growths. Dr. John Byrne, of Brooklyn, stands almost alone in the use of this agent for this purpose. He reports excellent results, but his technical skill is unique.

ENUCLEATION of the cancerous uterus, by which is meant its removal by keeping within the course of the uterine arteries so as



to leave the broad ligaments in situ, is not to be considered, as it is entirely inadequate.

INOPERABLE CASES. Unfortunately quite a large number of the cases coming to the specialist have advanced so far that hysterectomy is impossible, or at least utterly unjustifiable. The reasons for this are that the early symptoms of cancer, as has been already stated, are frequently so slight that the patient does not consider it necessary to consult any physician. In addition to this, many physicians in general practice are unquestionably very careless in making their examinations, and many of them will allow these cases to go on for months without making any local examination at all. The time has certainly come when the profession at large must be educated to make immediate examination of all suspicious cases, and if the conditions present are such as to leave any doubt as to diagnosis there should be no delay in having this settled by a resort to every known means of investigation.

PALLIATIVE TREATMENT. Great comfort will be afforded the patient and life unquestionably prolonged if under the above circumstances the diseased tissue is thoroughly, and if necessary repeatedly, removed by the sharp curette and scissors. The foul odor disappears, and the local discomfort is greatly diminished. The patient should be directed to use injections of carbolic acid, or preferably of permanganate of potash (one-half per cent.). If there is much hemorrhage this can best be controlled by a tampon saturated with some astringent. Ergot is entirely useless in the control of such hemorrhage.

Under these circumstances it is unwise to tell a cancer-stricken patient the exact nature of her disease. The terrible word "cancer" should not be uttered in her presence. She may be told that she has an "abscess," or "ulceration," or a "slough," and she will many times go to her grave happy in her ignorance and with life prolonged and rendered more cheerful by the presence of hope. Some immediate relative or intimate friend should, of course, be informed of the nature of the disease, and under some



circumstances it may be necessary to inform the patient herself; but when that is once done, and the incurable character of the disease revealed, she at once sinks into helpless and hopeless invalidism and the fatal termination is not long deferred.

CANCER OF CERVIX WITH PREGNANCY. If this condition is recognized early a hysterectomy should at once be made, if the case is operable. If necessary abortion may be first induced and the hysterectomy made about ten days later. If the condition is not recognized until late in the pregnancy, or if, owing to adhesions or extension of the disease, the case is inoperable, no interference should be made, but delivery should be accomplished at full term with the forceps if possible, or if not, by Cesarean section followed by immediate hysterectomy if the case is suitable.



## CHAPTER XX.

### ECTOPIC PREGNANCY.

THE pathology of ectopic pregnancy may be considered, thanks to the labors of Tait and others, as fairly well settled. Its treatment also has been settled within very narrow limits. The chief interest, however, hangs upon its

DIAGNOSIS. Our real knowledge of extra-uterine pregnancy may be said to date back to less than twenty-five years ago. At that time we were having many cases of death from so-called accidental hemorrhage into the peritoneum, and deaths from intra-peritoneal and extra-peritoneal hemocele. Cases had been reported by various writers of fetuses found at post-mortems in the abdominal cavity, and of lithopedions found at autopsies made many years after the pregnancy from which they dated their origin. While, a few years ago, the rank and file of the profession could not but regard as extraordinary the diagnostic acumen of the men who could make the diagnosis of tubal pregnancy on the occurrence of rupture, the time has now come, with the increase of literature on this subject and our great familiarity with its symptomatology, when intelligent physicians expect almost uniformly to make a correct diagnosis on such occurrence. The sharp, colicky pains, the syncope and the collapse, at once attract attention and point almost unerringly to the diagnosis. But a diagnosis deferred until rupture has occurred, necessarily results, in a large proportion of cases, in being but the preliminary to a fatal termination. The patient may be far removed from surgical assistance and death may occur long before such assistance can be obtained.

With our present knowledge on the subject I believe that it is now possible, in a fairly large proportion of cases, to make a diagnosis of tubal pregnancy before the occurrence of rupture. A few years ago the diagnosis of appendicitis was not made until



the occurrence of rupture of the appendix and the resulting peritonitis or abscess; but now it is, in an enormously large proportion of cases, made before rupture occurs, and all operating surgeons are able to report their scores of cases of removal of the unruptured but diseased appendix. In his published lecture on Ectopic Pregnancy, issued in '88, Mr. Lawson Tait distinctly says that he doubts very much if the opportunity to examine an unruptured ectopic cyst has ever occurred; to use his own language, "I am of opinion that no authentic description exists of an unruptured tube pregnancy." In this book he states that he himself has seen but one case before the period of rupture. In that the diagnosis was not made at the time of the examination, but the ruptured cyst was found when operation became necessary, three days later, on account of the supervention of alarming symptoms.

It is true that in many cases of tubal pregnancy no symptoms occur which lead the woman to suspect anything wrong, least of all to consult a physician, until the supervention of the alarming symptoms due to the rupture and its resulting hemorrhage. Nevertheless, there are unquestionably very many cases in which symptoms do arise, and in which the physician is consulted, and in which a presumptive diagnosis is possible.

There are no pathognomonic symptoms of tubal pregnancy, or of any other form of ectopic pregnancy. Usually, however, we find the following points: The patient gives a history of several years of sterility (many exceptions); she has missed a menstrual period, perhaps two of them; she has noticed some unusual pains in the pelvis, which she will probably describe as boring, griping, or colicky in character; she has, perhaps, within a few days of the time of consulting her physician had a more or less irregular hemorrhage; perhaps has discharged pieces of membrane which she has supposed indicated an early miscarriage, and sends for her physician with the idea that she is having a miscarriage, owing to the hemorrhage and the pain and the suspicion of a preceding pregnancy. Possibly, however, there has been no suspicion of pregnancy, as the woman has accepted her sterility



as incurable and has dismissed from her mind such a possibility. On making a vaginal examination, if the conditions are favorable the examiner will probably find upon one side or the other of the uterus, or back of it, a fusiform, well-defined cystic tumor, of about the size of a small egg. This tumor will be quite tender on pressure, and will probably be distinctly pulsating. When such a tumor is found in a woman in whom we have reasonable grounds to suspect a pregnancy; when the uterus at the same time is found somewhat enlarged and having the feel of pregnancy, but not enlarged as much as we would expect in a pregnancy of so long continuance as the history indicates, a presumptive diagnosis of tubal pregnancy is warranted, and the matter of an operation should be carefully and without delay considered.

There are a few conditions which give us the same kind of a tumor as is found in these cases, but fortunately all of these conditions are such as to justify, if not to demand, operative interference. An enlarged ovary in Douglas's cul-de-sac cannot, perhaps, be differentiated from a tubal pregnancy in the same location. A pyosalpinx, a hydrosalpinx, a small cyst of the broad ligament, or an enlarged ovary in its normal location, can be mistaken for an unruptured tubal pregnancy. It is not likely that any of these conditions would be accompanied by symptoms pointing to an ectopic pregnancy, and yet they may; but all these conditions are such as to justify operative interference. If the operator, suspecting a tubal pregnancy, finds a pus tube or a cystic ovary, he has certainly benefited his patient by their removal; while if he finds an unruptured tubal pregnancy he has, by a very simple operation, saved his patient from the gravest of dangers. In other words, he has performed an operation the mortality of which is almost nil; while the mortality of ruptured tubal pregnancy, while necessarily unknown, is certainly frightful.

In my own experience my records show at least six cases in which the diagnosis of ectopic pregnancy was made before rupture and verified at the operation, which was made immediately after the diagnosis. I know of several other cases in which a



similar early diagnosis has been reached. It is necessary for physicians to learn to suspect ectopic pregnancy and examine with that suspicion in mind. Until physicians learn to expect ectopic pregnancy they will seldom or never find it. The physician who, without making any examination, tells all the middle-aged female patients, who come to him complaining of irregular hemorrhages, that they are merely having the change of life, will probably tell his patients who come to him with symptoms of ectopic pregnancy that they are merely threatened with a miscarriage. He will make no further investigation and will hence uniformly fail to make a diagnosis. The physician, however, who has in mind the possibility of an ectopic pregnancy will thoroughly examine all patients whose history or symptoms point to this condition, and in a certain proportion of cases he will make a correct diagnosis, and by prompt interference achieve a signal triumph for himself and the profession.

DEVELOPMENT. The development of the ovum takes place the same when it is lodged in the Fallopian tube as if it were in the uterine cavity. The external opening of the tube may become dilated and the ovum expelled, either in whole or in part, thus constituting a tubal abortion. If this abortion is complete the hemorrhage may entirely cease and a quick recovery follow. If incomplete, the hemorrhage will continue and the symptoms of its continuance be the same as those of any other hemorrhage.

If the fetus continues to develop, rupture will take place sooner or later. This usually occurs between the sixth and tenth weeks. Occasionally it occurs earlier; occasionally is deferred a few days longer. It is *intra-peritoneal* when the rupture in the tube is so situated that the blood escapes directly into the peritoneal cavity (Fig. 103). If the tube, as happens in a fair proportion of cases, gives way inferiorly, that is in the part lying between the folds of the broad ligament, the rupture is *extra-peritoneal* and the blood escapes into the space between the folds of the broad ligament and not into the peritoneal cavity (Fig. 104). The hemorrhage in the intra-peritoneal form is usually much



larger in amount and takes place more rapidly than when extra-peritoneal. The rupture is usually accompanied by pain, generally of a tearing character, with symptoms of profound shock, the depth and duration of the shock depending upon the amount of blood lost.



FIG. 103.

Rupture of tube directly into  
the peritoneal cavity.



FIG. 104.

Rupture of tube downward, separating  
folds of broad ligament.

If a rupture occurs in the broad ligament, the ovum may be discharged so slowly, or at least with such little interference with its vascular connections, that development continues in its new location. The placenta, under these circumstances, may be attached to any of the surrounding tissues.

**SECONDARY RUPTURE.** As the walls of this sack are naturally thin and, with the increase in size of the fetus, tend to become thinner, rupture occurs almost inevitably sooner or later. This is known as secondary rupture and usually results in terrific hemorrhage and prompt death. Occasionally, however, the surrounding peritoneum becomes dissected up without rupturing and pregnancy continues to full term, constituting what is then known as abdominal pregnancy, the fetus being, however, entirely outside the peritoneal cavity. At this time symptoms of labor come on, the cause of which is obscure. This spurious



labor may last for several days, or even two or three weeks, and then cease. The child dies and becoming infected breaks down into an abscess, usually with profound symptoms of septicemia; the abscess, if the patient's life is prolonged, discharges into some of the hollow abdominal viscera or through the abdominal parietes. If infection does not take place, the fetal remains may become mummified, or becoming impregnated with lime salts may result in what is known as a lithopedion. Under such circum-



FIG. 105. Lithopedion removed by the author, in connection with an ovariectomy, after having been carried for twenty-three years. It is represented in a squatting position, with a match passing under one forearm, the head being detached and in front.

stances the fetus may remain harmless for many years, though its presence is a constant menace under any circumstances. Figure 105 represents such a lithopedion which was removed in the author's practice after a harmless and unsuspected existence for twenty-three years between the folds of the broad ligament. Its removal was incidental to the removal of a large ovarian tumor.

**TUBO-UTERINE GESTATION.** This is the term given to designate the development of the embryo in that portion of the tube which passes through the uterine wall. Such cases are exceed-



ingly rare. As development takes place the pregnancy tends to become either entirely tubal or entirely intra-uterine; otherwise it splits the wall of the uterus and becomes interstitial. As the surrounding parts are immensely vascular, rupture is almost necessarily followed by immediate death.

TREATMENT. If the diagnosis is arrived at before rupture, immediate operation should be made. This operation will differ in no respect from that of an ordinary oöphorectomy.

If the diagnosis is not made until rupture has occurred, immediate operation should still be the rule unless it is entirely evident that the patient's condition is such as to render active interference necessarily fatal from the slight added shock. Under these circumstances, the hemorrhage has usually ceased from lack of blood for its maintenance. Absolute rest may therefore be permitted for a few hours until evidences of rallying appear, when the operation should be proceeded with before the hemorrhage can again start up.

If the surgeon can satisfy himself that the hemorrhage is extra-peritoneal, delay is probably safe. The hemorrhage will take place more slowly, it will be more limited, and will probably cease long before the woman has become exsanguinated. After a few days the sack can be opened through the vagina, the blood clots removed, drainage inserted, and recovery confidently expected. If the hemorrhage is not too large and the condition of the patient good, still further delay may be advisable until time shall determine whether complete absorption of the effused blood will not take place.

In those rare cases in which the pregnancy is continued to full term, active interference should be made in the interests both of mother and child. If the interests of the mother alone are to be considered, it is probably safer to delay operation until several days have elapsed after the death of the child, as time is thus given for the cessation of the maternal circulation through the placenta, or even for its partial separation. If operation is then made, the fetus can be removed from the gestation sack, together with the



placenta, without risk of serious hemorrhage. If no infection has yet taken place, the abdomen can be closed without drainage, but otherwise free drainage should be provided for.

As certain moral and legal obligations pertain to the living full-term fetus, the best treatment of these cases consists in interference before the onset of the spurious labor. The fetus should be removed by an abdominal incision similar to that for Cesarean section, the cord being temporarily clamped and severed. If the placenta is then found so attached that by the use of ligatures it can be safely removed, its removal should be at once made. It is sometimes found attached to the uterus in such a way that a hysterectomy may be wisely undertaken. If its removal does not seem to be prudent as much blood as possible should be expressed from it through the cord, which should be cut off close to the placental surface. The fetal sack being sponged dry, the abdomen should be carefully closed. If no infection has taken place, the placenta will give no trouble, but will gradually be absorbed and disappear. Should infection have taken place, however, the placenta will soon give indications of being a septic foreign body, when the abdomen must be at once re-opened. At this time it will usually be found that the circulation of the placenta has been so changed that the mass can be safely removed. Otherwise the cavity should be packed with gauze and the placenta allowed to come away by sloughing. The danger to the patient is great if this necessity arises, but the course advised is that which is doubtless, all things considered, safest.

While what is called abdominal pregnancy is almost invariably, as previously mentioned, extra-peritoneal, the peritoneum being dissected up from the pelvis as the fetus develops, a few cases are unquestionably on record in which the child is found within the peritoneal cavity. Under these circumstances it is believed that the fetus reaches the peritoneal cavity either as a result of an early tubal abortion or through secondary rupture of the broad ligament. As such rupture of the broad ligament can hardly be conceived of as unaccompanied by profuse hemorrhage, the early history of the case would probably serve to determine the fact.



## CHAPTER XXI.

### SALPINGITIS.

**T**HIS affection seldom exists alone as a distinct disease. The same causes which produce inflammation of the tube almost invariably extend so as to involve the peritoneum at the orifice of the tube and the ovary. The symptoms, therefore, of salpingitis may be regarded as constantly blended with those of ovaritis and of metritis.

**PYOSALPINX.** The tube having become acutely infected, the inflammatory action ordinarily results in closure of the abdominal and uterine openings. The pus is thus retained and may accumulate so as to form quite large abscess cavities with well defined walls. As the accumulation of pus increases the walls of the tube become thinned, so that rupture is a possible and threatening complication. In some cases there is a yielding of the uterine obstruction, so that at irregular intervals there may occur a discharge of several ounces of pus from the tube into the vagina through the uterus. Such cases have been reported from time to time, but in no instance probably have they been verified by post-mortem or post-operative findings. If the abdominal opening becomes patent, there will occasionally occur a more or less localized infection, showing itself by a pelvic peritonitis.

In recent cases the retained pus is exceedingly virulent, and if discharged into the peritoneum quickly excites an acute peritonitis. In chronic cases, on the other hand, the pus is almost invariably sterile, and hence its rupture into the pelvis during operations is of comparatively little moment.

**HYDRO-SALPINX.** If both ends of the tube become occluded by inflammatory adhesions or exudate, the normal secretion of the mucous lining may go on and result in an accumulation of thin watery fluid which constitutes the condition known as hydro-salpinx. Under certain circumstances it is possible that this



watery fluid is the remains of a pyo-salpinx, the pus having undergone degeneration with absorption of a part of its contents. The watery fluid is entirely sterile, and if, as occasionally happens, rup-



FIG. 106. General appearance of a tube distended with fluid, the ovary being below.

ture takes place no ill results follow. While in most cases the tube attains only the size of a finger or two, it may become distended until the sack is as large as a fetal head.

HEMATO-SALPINX is the name given to that condition of the tube in which the latter is distended with blood. While in the great majority of cases such a condition is the result of a tubal pregnancy, cases have undoubtedly been reported in which the blood originated directly from the walls of the tube and without any connection with pregnancy.

ETIOLOGY. Salpingitis is always the result of some species of infection. The most common is probably that of gonorrhea, either in its acute form or more frequently as it is attenuated in gleet. Many newly married women become thus infected, and the ingenuity of the attending physician is taxed to satisfactorily explain to them what to him is self-evident.

Infection following labor, but more particularly following abortion, is certainly one of the chief causes of this disease. The retention of gangrenous debris for several days in the uterine



cavity would almost necessarily lead to infection involving the tubes and ovaries, this infection being due to direct extension by continuity of tissues. It not infrequently happens that the gonorrheal and puerperal infections are mixed.

Tubercular salpingitis doubtless occasionally results from the entrance of the bacillus through intercourse. Most frequently, however, it is the result of auto-infection, the bacilli being introduced through the lungs or intestinal tract.

Direct migration of the bacterium coli commune rarely occurs, but its possibility must be borne in mind; especially when there is a history pointing to a preceding appendicitis.

A source of infection not to be disregarded is that from the introduction by the surgeon of a sound, curette, or other instrument into the uterine cavity. Unless the utmost care is observed, infection is very likely to be introduced in this way.

DIAGNOSIS. Acute salpingitis is almost invariably found as an accompaniment of an acute endometritis. The symptoms, therefore, of the two diseases are necessarily blended. Pain, sometimes quite intense, is a marked characteristic of the disease. This is increased by pressure, whether exerted through the abdominal walls or by the vaginal touch. Bi-manual examination reveals an exquisitely sensitive mass in the region of the tube. The tube itself cannot usually be distinctly outlined because of the amount of exudate surrounding it. If this tender mass is limited quite accurately to the locality of the tube, it may be considered that the disease is limited to this anatomical part. The involvement of the ovary will be indicated by the greater extension of the disease, or, as most frequently happens, the entire pelvis, or at least one-half of it, will be involved in the inflammation. Under these circumstances the hard mass of exudate, with the fixation of the uterus and the tenderness of the vaginal roof, will easily establish the fact of the existence of a pelvic peritonitis with general involvement of the tubes and ovaries. No distinction is possible under these circumstances between the different organs involved, nor is this distinction of any importance.



PROGNOSIS. In all cases of inflammation of the appendages a very guarded prognosis should be given as regards complete recovery from the disease. With proper attention nearly all cases will make a recovery so far as the more marked and immediate symptoms are concerned, but that the disease is not entirely cured is shown through the frequency with which relapses take place and the infrequency of subsequent pregnancies. It is, however, within the experience of nearly every practitioner to have met with cases of at least symptomatic cure, in which there has been no subsequent history of disease or of sterility.

TREATMENT. This does not differ materially from that of endometritis which has already been considered. Rest, purgatives, hot water douches, with sedatives, and, if necessary, opiates, can most safely be depended upon.

If there is stenosis of the cervix interfering with drainage, dilatation should be made, but curetting should not be resorted to in this form of the disease.

Although these cases usually terminate favorably under suitable local and constitutional treatment, each case requires careful watching, and not infrequently the disease extends to the peritoneum or to the ovaries and connective tissue, resulting in abscesses. No operative interference is indicated, however, unless the operator becomes satisfied of the existence of pus. Resolution will take place frequently, even in the midst of a large amount of exudate, with ultimately entire absorption, as a rule, of the entire mass. If, however, the fever continues, if the pelvic tenderness increases, and if evidences of a more general peritonitis ensue, abdominal section should be made. If the disease is found to involve the tubes and ovaries, the diseased appendages should be removed, the pelvis cleaned out, and drained if necessary. If, however, the broad ligaments seem chiefly involved it is sometimes wise to open through Douglas's cul-de-sac and drain from below. This opening does not prevent an abdominal section later if found not to give sufficient relief.



In those desperate cases in which, as the result of salpingitis, not only the tubes and ovaries but the general connective tissue of the pelvis becomes involved in abscesses, it is unquestionably many times safer to operate through the vagina. The pus in these cases is usually virulent in character, while the patient's condition is such as to render extensive abdominal work, even if immediate infection does not occur, almost necessarily fatal. In these cases Douglas's cul-de-sac can be opened freely, the entire pelvis explored, washed out and drained. The symptoms will be immediately relieved and unless the womb itself is involved, no further operation in the majority of cases will be needed. If, however, the uterus is infected, a preliminary vaginal hysterectomy should be made, which will give plenty of room for the opening up of pus tubes and abscesses and their most satisfactory drainage. In case the symptoms persist they will be much less active in character, and the condition of the patient will be so far improved that an abdominal section can be safely made, if necessary, a few weeks later. Preliminary vaginal incision and drainage will, however, in a large majority of cases preserve a life which would be placed in most imminent jeopardy by an abdominal section, and for this method of procedure, if for nothing else, the profession owes a debt of gratitude to the French school of vaginal hysterectomists.

CHRONIC SALPINGITIS. Occasionally the acute disease does not yield to antiphlogistic treatment, but sooner or later assumes the chronic form. Usually, however, the chronic form is such from the start. In these cases we find the usual symptoms of "female weakness" well marked, as we have here chronic endometritis together with the involvement of the appendages and usually more or less peritoneal adhesion. Backache, headache, bearing down and dragging sensations, profuse leucorrhea, menorrhagia, painful defecation, irritable bladder, and dyspareunia, together with more or less breaking down of the general health, are the usual symptoms. Bi-manual examination shows an enlarged and tender uterus, usually with a somewhat patulous



cervix, the thickened, swollen, tortuous and exquisitely tender tubes, from which the ovaries can hardly ever be distinguished, filling up the pelvis upon each side, unless the disease happens to be unilateral, and including the uterus itself more or less firmly fixed by adhesions. Whether the tubes are distended with serum or pus is to be determined more by the history of the case than by the local conditions. The determination of the character of the tubal contents is, however, entirely unimportant as regards treatment.

TREATMENT. While chronic salpingitis, even if puerperal in character, does not often destroy life, its effect upon the health, happiness and usefulness of the patient are such as to render operative interference not only justifiable but absolutely demanded.

Just what operative procedure should be resorted to must necessarily depend upon the character and extent of the lesions present. Chronic non-purulent salpingitis may occasionally require only a dilating and thorough curetting of the uterus with drainage. Only a very few cases, however, will be cured by as simple a procedure as this.

Ordinarily an abdominal section will be necessary, with removal of the diseased appendages. If the inflammatory destruction has not been too extensive, if the patient is quite anxious to conceive, and if the conditions otherwise are favorable, it is possible in some cases to break up the adhesions, open the diseased tube, wash out its contents, make permanent the opening by stitching the mucous and peritoneal surfaces together by fine cat-gut, and close the abdomen. Under rare circumstances such a procedure will be followed by a re-establishment of the patency of the tube and a resulting pregnancy.

No diseases with which the gynecologist comes in contact require greater judgment or higher operative skill than do many cases of old pus tubes. Extensive and firm adhesions to adjoining viscera frequently render these operations most difficult and dangerous.



While the pus in these chronic cases is usually sterile, so that the dangers of direct infection are not great, there is great danger of hemorrhage and of injuries to bladder, bowel, and ureter. With the utmost care there is almost invariably a good deal of blood lost from oozing and this, together with the length of time required, usually results in marked post-operative shock.

It is of absolute importance that the operator should be able to find and follow the "lines of cleavage" which exist where adjacent layers of peritoneum have, as a result of the inflammatory process, adhered together. By following these lines the thickened walls of a broad ligament abscess, together with tube and ovary, will be quickly and safely shelled out.

While this shelling out process can most frequently be done by working from behind forward and below up, it is sometimes best to sever the tube from the uterus at its junction with that organ and then work from this point outward toward the pelvic wall. In this way the sack will sometimes be removed entire, which would otherwise have been ruptured.

In removing a pus tube the uterine artery should be ligated half or three-quarters of an inch below the tube, where it passes up alongside the uterine body. The tube itself should then be removed by cutting out a wedge-shaped piece of tissue from the uterus, and ligating by as many ligatures as necessary the remaining broad ligament pedicle. With fine catgut the top of the pedicle should then be overcast, so as to leave no raw surface exposed, and with the same suture the edges of the uterine incision approximated. If this precaution is not taken, but the tube is simply tied off as is frequently done, the ligature is quite liable to become infected and give rise to a fistula, even if general infection does not occur.

If one tube only is involved and the opposite appendages seem healthy, and if the patient is young and anxious to become a mother, the uterus and remaining appendages should be left. Under these circumstances, however, a thorough curetting of the endometrium should be made so as to remove as completely as



possible any remaining source of possible infection. If, however, there is marked endometritis with hyperplasia, the surgeon will probably save himself trouble and his patient much suffering, and probably a repetition of the operation, if he removes both appendages at the same time. It is my own custom in these cases to ascertain beforehand the wishes of the patient and be influenced largely by her desires. I have said "influenced," not "governed"; the surgeon should never undertake an operation of this kind, or indeed of any other kind in which a cavity is to be opened, without the distinct understanding that as regards the character of the operation, what shall be removed and what left, he is to be governed purely by his own judgment. If the patient cannot consent to trust herself to the judgment of her attending physician, he should insist that she seek other counsel.

**HYSTERECTOMY.** In cases in which it is necessary to remove both appendages it will, in a majority of cases, 'be the part of prudence and wisdom to remove the uterus at the same time. If, as a result of extensive adhesions, the body of the uterus is largely denuded of peritoneum, or if the uterus is the seat of marked hyperplasia, there can be no reasonable question as to the propriety of this procedure. If, on the other hand, the uterus is practically normal, if the preceding endometritis, either spontaneously or as the result of treatment, has subsided, there can be no objection to permitting this organ to remain. It should 'be allowed to remain, however, because of the slightly greater risk in its removal, and not because the patient will suffer in any way, mentally, morally, or physically, by its removal.

After a rather unusually rich experience in this kind of work I have no hesitation whatever in saying that young women who under these circumstances have been subjected to hysterectomy make more complete and satisfactory recovery, so far as local symptoms and general manifestations are concerned, than do those in whom the uterus, entirely deprived of its appendages, has been allowed to remain.



CONSERVATIVE OPERATIONS. While the thorough removal of diseased structures is safer as regards the life of the woman than leaving any unhealthy tissue behind, it is sometimes best, nevertheless, in cases in which the patient is anxious to become a mother, to subject her to some increase of risk in order that diseased but not hopelessly destroyed ovaries and tubes may be preserved, in whole or in part. It is thus frequently possible to save a portion of an ovary, the diseased part being cut out by a wedge-shaped incision and the edges of the incision approximated with fine catgut. A hydro-salpinx may be safely opened and cleaned out, an oval section being removed along its upper border and the mucous and peritoneal edges of the incision caught together by a continuous suture of fine silk or catgut so as to maintain the patency of the opening. As the contents of old pus tubes are sterile, even these may be cleaned out and treated in the same way; the thickened tissues occluding the uterine end of the tube will sometimes be absorbed later on and a pregnancy may result.

It is only seldom that these conservative operations will be followed by a pregnancy, but if the patient, after having had explained to her the added risks and the slight probability of a pregnancy, elects to assume the risk, these conservative operations can frequently be made with reasonable prudence. These so-called conservative operations are not only in themselves more dangerous than radical procedures, but as the tissues left behind are far from healthy the operations are very liable to be failures as regards cure and to require the ultimate performance of complete and radical removal.



## CHAPTER XXII.

### INFLAMMATION OF THE OVARY.—OVARITIS.— OÖPHORITIS.

**T**HIS inflammation is usually the result of extension of disease from the Fallopian tube, and is therefore common as a result of gonorrheal infection or puerperal sepsis. It occasionally occurs as an accompaniment of acute rheumatism, or of the eruptive fevers. It sometimes occurs as a metastasis in mumps.

The inflammation varies from simple congestion to the formation of pus with entire destruction of the organ.

**DIAGNOSIS.** The symptoms of acute ovaritis are usually a part of those accompanying the salpingitis and metritis. If the inflammation is limited to this organ, the fact of its limitation will probably be determined by a bi-manual examination rather than by any peculiar symptoms accompanying it.

**TREATMENT.** This is expectant and similar to that for acute pelvic inflammation in general. If the disease does not subside but gives evidence of the formation of pus, the abdomen should at once be opened and the ovary removed unless it has become prolapsed into Douglas's cul-de-sac, when it may be more easily reached through the vagina.

**CHRONIC OVARITIS.** In this form of disease the affection is usually bilateral and the parenchyma may be chiefly involved, or the interstitial connective tissue. In the one form the ovary becomes filled with a number of cysts, these being transformed ovarian follicles. Under these circumstances the ovary becomes enlarged, though seldom larger than a small hen's egg. In the other form of inflammation there is marked increase in the connective tissue and the follicular connective structure proper becomes much diminished. The ovary is hard, pale, and presents a fissured and warty appearance.



When not the result of the subsidence of acute inflammation the causes of chronic ovaritis are not well understood.

**SYMPTOMS.** Pain is the most marked symptom of chronic ovaritis. This pain is most pronounced just before and during the early part of menstruation. If the menstrual flow is profuse the pain usually diminishes. Pain is also manifested during defecation and coitus. As the disease is generally bilateral the pain will be noticed in both ovarian regions. Reflex disturbances are usually very marked in this affection.

**DIAGNOSIS.** This is generally established by the history of the case and bi-manual examination. This examination shows tender and usually enlarged ovaries. In the cirrhotic form, however, the ovaries may be much smaller than normal.

**TREATMENT.** Under rest, hot water douches, counter irritation, applications to the vaginal vault and general improvement of the patient's condition, improvement will ordinarily take place in the local conditions. Such improvement, however, is usually temporary in character and relapse occurs as soon as treatment ceases.

Operative interference will in most cases be found necessary, this consisting in removal of the ovaries either through the vagina or abdomen. While the disease is usually bilateral, it not infrequently happens that the disease has advanced much further upon one side than the other. If, however, at the time of operation this condition of unequal manifestation is present and the operator removes but a single ovary, hoping that he can prudently save the other, he will almost certainly be disappointed, as within a few months his patient will return in a condition demanding a second section for the removal of the second ovary, which will now be found in fully as bad condition as was the first. Conservative surgery in this form of ovaritis is such only in name. True conservatism consists in removal of both ovaries.



## CHAPTER XXIII.

### UTERINE DISPLACEMENTS.

**W**HEN the parts are in their normal condition the uterus is held as a fairly movable organ between the bladder and rectum. Its position is changed slightly by each act of respiration and by any change in the position of the trunk. It is pushed backward by a distended bladder, or forward by a distended rectum. Normally it lies slightly tipped forward on the bladder, the latter serving as a water cushion for its support.

The structures which support the uterus in this position are chiefly the pelvic floor and perineum, and the round, utero-vesical, utero-sacral, and broad ligaments. Upon the integrity of the pelvic floor and perineum depends the proper elevation of the uterus, while the ligaments are chiefly concerned in maintaining its axis in the proper position.

The uterus may be bent upon itself anteriorly (anteflexion), or posteriorly (retroflexion); or the entire body may fall forward (anteversion), or backward (retroversion); or the entire uterus while anteflexed may fall backward into retroversion, or, theoretically at least, a retroflexed uterus can fall forward into anteversion. The uterus is sometimes drawn over to one side by adhesions, or pushed over by new growths, into what is called latero-version. If the uterus sinks down into the pelvis, this condition is known as prolapse. If this becomes so exaggerated that the uterus passes through the vulva, the condition is known as procidentia. Prolapse and procidentia are usually the later stages of retroversion.

ANTEFLEXION and anteversion seldom give rise to any symptoms which require attention. Indeed a certain degree of anteflexion is the normal position of the virgin uterus. For diagnos-



tic purposes it is well to bear in mind that this flexion of the uterus may be of the body, the position of the cervix being normal, or of the cervix, the position of the body being normal, or both may be involved.

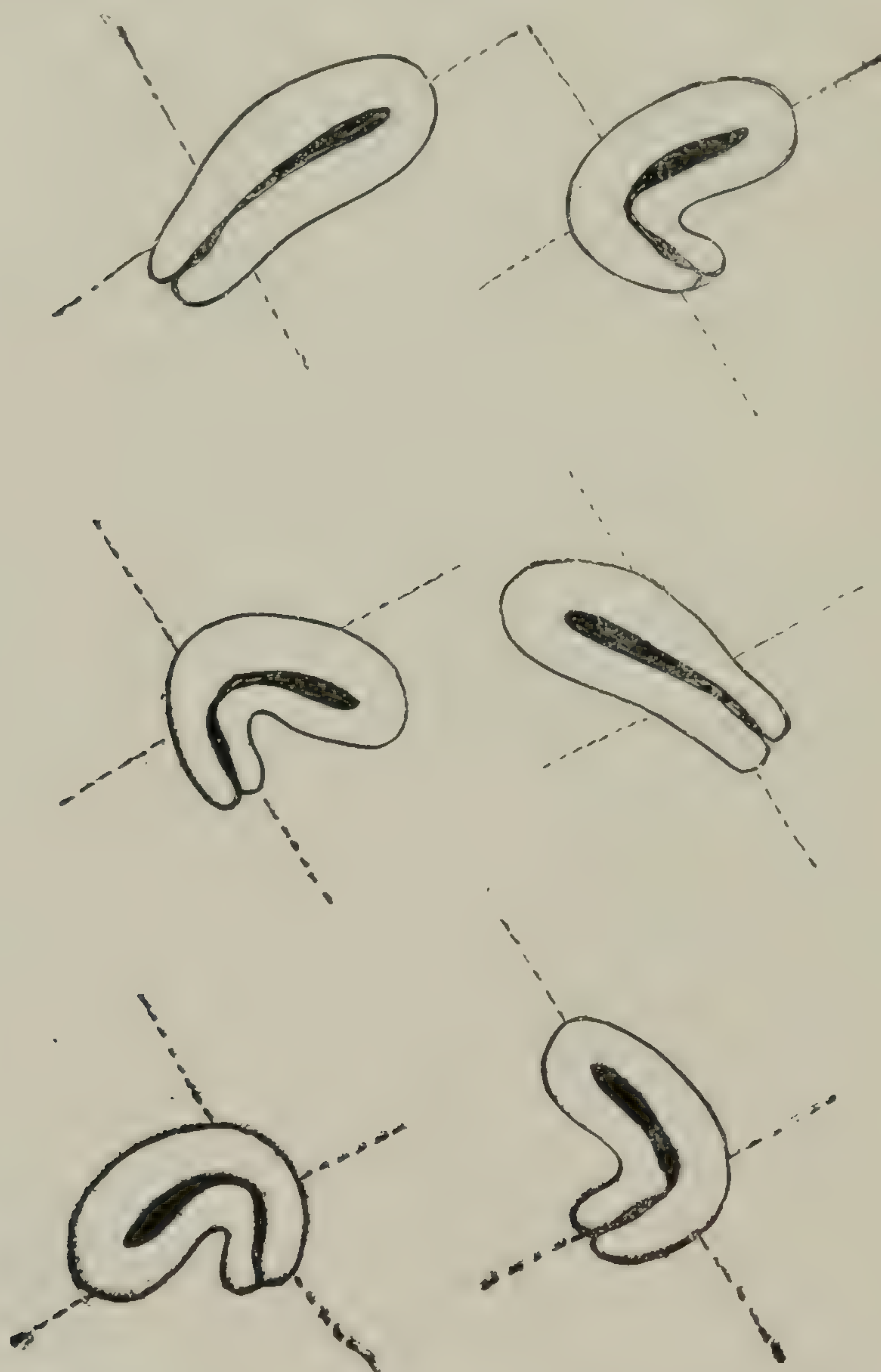


FIG. 107. Diagrams illustrating flexions and versions of the uterus.

Normal position.

Anteflexion, cervix in approximately normal position.

Retroversion with retroflexion.

Anteflexion, fundus being in normal position.

Retroversion.

Anteversion with retroflexion.

When not congenital, anteversions and flexions are usually the result of inflammatory conditions producing adhesions and contraction of the tissues.



**SYMPTOMS.** These are usually given as dysmenorrhea and sterility, and those in general of endometritis. In a great majority of cases, however, these symptoms arise from the conditions producing the displacement and not from the displacement itself.

When prolapse exists, the symptoms of which the patient complains vary greatly and seem to bear no particular relationship to the degree of displacement. Indeed, many times patients with but little prolapse complain very much and seem to suffer much more than do those in whom there is complete procidentia. The usual complaints are of backache and of a feeling of weight or bearing down when on the feet.

**DIAGNOSIS.** This is easily made by bi-manual examination, conducted if necessary under an anesthetic, which reveals the position of the uterus.

**TREATMENT.** As these conditions are usually the result of preceding disease, the treatment should be directed to the removal or stretching of adhesions and to the mechanical relief of any possible obstruction which may be due to the sharp flexion of the uterine canal. Pelvic massage will accomplish much, but occasionally the adhesions will be so firm as to be only relieved by an abdominal section, or an opening of the anterior or posterior cul-de-sac and the treatment of the conditions found as indicated at the time of the operation. If there is dysmenorrhea due to the obstruction resulting from the sharp flexion, this can be overcome by thorough dilatation, which mechanically straightens the uterus, and which may be repeated from time to time if necessary.

**RETROFLEXION**, like anteflexion, when not congenital is the result of inflammatory adhesions or contractions. Retroversion, however, is due to one or more of a variety of causes. Under normal conditions, as stated before, the uterus is held lightly forward chiefly by the round ligaments, but somewhat by the broad ligaments. Relaxation of these ligaments will permit the uterus to sink a little lower in the pelvis than normal, and at the same time to become tilted backward. As the intestines are thus per-



mitted to rest upon the fundus and partially on the anterior face of the uterus, the displacement constantly tends to become increased.

While this process of displacement is usually a gradual one, it may sometimes occur suddenly as the result of a fall, the patient striking forcibly upon the nates or back. Under these circumstances there is usually a considerable amount of local disturbance so that advice is soon sought. At other times, however, when there can be no reason to doubt the manner of production, the disturbance may be so slight as to give rise to no anxiety or apparent necessity for securing relief.

ETIOLOGY. When not produced by violence, or as a result of relaxation of the ligaments, retroversion is ordinarily the result of prolapse. If there is any giving way of the pelvic floor, either as the result of traumatism or relaxation, or if the yielding results from the constant weight of a uterus that is hyperplastic from metritis, or in sub-involution from any cause, prolapse results; and as the prolapsing organ follows the line of Carus's curve, it soon reaches a point where the body of the uterus falls behind the cervical base and is at once in the position of retroversion. This mal-position being once reached it usually becomes quite rapidly increased, owing to the weight of the intestines resting upon the fundus and anterior surface and also to the increased weight of the uterus itself, this increase being due to the congestion incident to the interference with the venous return of blood. As the prolapse becomes more marked a point is finally reached at which the main support of the uterus is from its ligaments and no longer from the pelvic floor.

SYMPTOMS. The symptoms of retroversion do not differ at first in any essential particular from those of the accompanying metritis. There is the usual leucorrhea, menorrhagia, dysmenorrhea, sterility or tendency to abortion, and sensation of weight in the pelvis with a dragging pain in the back and thighs. More remote symptoms are also present, such as headache and nervous disturbances. In exaggerated mal-positions there is a tendency to constipation from mechanical obstruction and also more or less



irritability or tenesmus of the bladder from the pressure of the misplaced cervix upon that viscus.

DIAGNOSIS. This is usually easily established by bi-manual examination. It is sometimes, however, not easy to determine whether the body felt in Douglas's cul-de-sac is a retroflexed fundus or a fibroid. If the diagnosis can be established in no other way, it may be necessary to carefully introduce the sound for the purpose of clearing up the doubt.

Sometimes an adherent, prolapsed, and enlarged ovary will so closely resemble a fibroid in the posterior wall of the uterus as to render a differential diagnosis difficult or impossible.

TREATMENT. This will depend very largely upon the accompanying conditions rather than upon the displacement itself. In simple retroversion, especially if the result of a fall, the wearing of a properly adjusted pessary for a few days or weeks will usually effect a cure. Even if the displacement is marked, if without too much prolapse, the pessary may be worn with comfort and advantage and may be regarded as a very satisfactory method of palliative treatment. If the parts are too tender to bear the pressure of a pessary, the patient should be placed in the knee-chest position, reduction accomplished, and the perineum being retracted by a Sims' speculum or other retractor, the vaginal vault should be packed with pledgets of cotton, or better still of absorbent wool. These pledgets should be packed in with care, so as to give a uniform support to the vault. The tampon thus introduced should be brought down nearly or quite to the vulva, the patient being directed to remove some of the lower portion if she finds the pressure producing too great inconvenience. This tampon can be allowed to remain for three or four days, when it should be removed, the vagina thoroughly cleansed with a douche, and a fresh tampon inserted. This treatment continued for a few days or weeks will usually result in such a relief of the tenderness and reduction in size of the swollen uterus that it can be held in place by a properly adjusted pessary.



PESSARIES are of two kinds; the one getting its support chiefly from the perineum, the other being attached to a stem which is supported by elastic cords attached to an abdominal belt. The latter instrument is almost entirely an abomination, although

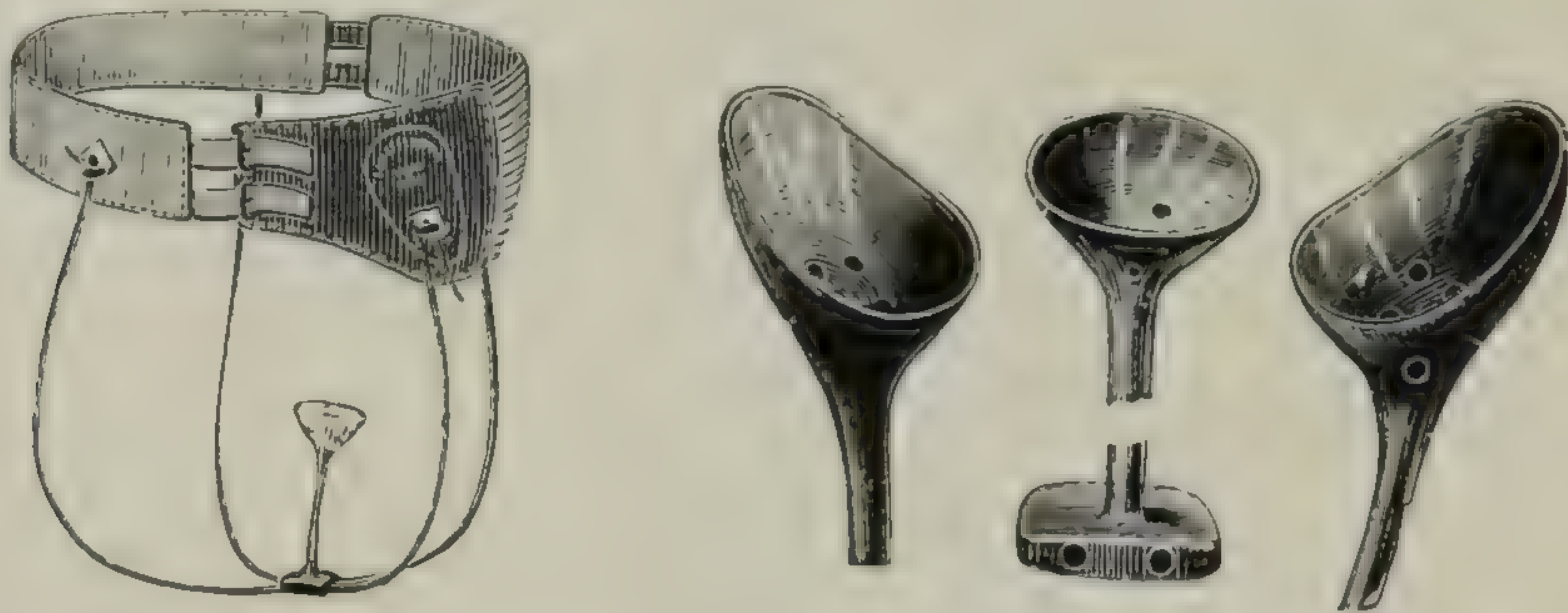


FIG. 108. Forms of stem pessary supported from abdominal belt.

in very old women, too old and feeble to submit to operative procedures, its use to support the atrophied uterus, which would otherwise be hanging between the thighs, may be a source of great comfort.

The most useful pessary is unquestionably the Thomas modification of the Smith-Hodge. It is made of hard rubber, and the enlarged cross bar furnishes a very satisfactory support to the posterior vaginal fornix. It should be borne in mind that the pessary hold the uterus forward, not by supporting it directly, but



FIG. 109. Thomas's pessary.

by raising the posterior vaginal vault and thus drawing the cervix back and tilting the fundus forward. The pessary should not be used to replace the uterus, but this should be done by the fingers before the pessary is introduced.

It is sometimes by no means an easy matter to reduce a retroverted uterus. Ordinarily, however, with patience and carefully



directed efforts in which the patient co-operates, replacement may be effected, provided there are no adhesions. Two fingers should be introduced into the vagina and placed upon the upper side of the cervix, which should then be pressed firmly down until the hollow of the sacrum is reached. At the same time the fingers of the unoccupied hand should be pressed down through the abdominal walls, and an effort made to thus tilt the fundus forward. If the abdominal walls are sufficiently relaxed this will be accomplished without very great difficulty. If, however, the walls are thick and rigid, or if the patient cannot be instructed to relax them, this method may entirely fail. Under such circumstances the patient should be placed in the knee-chest position and the perineum retracted, when, as the vagina becomes distended with air, it will be possible to draw the cervix forward with a tenaculum or bullet forceps, and so dislodge the fundus that it will fall forward by its own weight. If the fundus does not become thus dislodged it may be pushed forward by the fingers in the posterior fornix, or introduced through the rectum, the cervix being drawn forward, steadied, or pushed toward the hollow of the sacrum by the tenaculum as needed to assist the fingers engaged in pushing up the fundus. If the fingers are not long enough, some form of uterine reposition, or a dressing forceps holding a good sized pledget of cotton, may be used against the fundus instead.

As soon as the fundus becomes dislodged it at once, of its own weight aided by the traction of the intestines, drops forward, when a pessary may be introduced and the woman allowed to assume the erect position. After the pessary is placed in position the patient should be directed to walk up and down the room a few times, and should then be examined while standing. In this way the surgeon can easily determine the fit and effect of the pessary, and can introduce a larger or smaller size as may be indicated, or one with a different curve. The patient should be instructed to remove the pessary, in case it becomes painful, by introducing the finger within the vulva, catching the lower bar and drawing the pessary down toward her knees. She should be in-



structed that by this manipulation she can do no harm even though momentary pain may be inflicted as she draws it through the vulva. She should be directed to return within a few days, even if the pessary is giving no pain, in order that the examiner may determine whether it is doing its work satisfactorily. When the pessary has been found to be properly adjusted the patient should be instructed to return at intervals of not to exceed two or three months for re-examination. The importance of this should be impressed upon her, as many times cases have been reported in which women have forgotten the existence of the pessaries and have worn them for many years and until by pressure erosions and ulcerations have been produced, and even malignant disease itself as a result of the long-continued irritation. The wearing of a pessary for a number of months by nulliparous women will occasionally result in a cure, owing to the re-contraction of the over-stretched ligaments. More frequently, however, and almost uniformly in multiparæ, the retroversion recurs as soon as the pessary is removed. If this is found to be the case the matter should be explained to the patient in all its bearings, and she must then choose between the continued and indefinite use of the pessary or cure by operative interference.

It sometimes happens that, owing to the use of too short a pessary, or of too great laxity of the perineum allowing the pessary to sink too deep into the pelvis, the fundus becomes again retroverted so that the uterus comes to hang over the cross bar of the pessary. Under these circumstances a longer pessary must be introduced, or if the trouble still persists an operation is the only recourse.

The presence of adhesions, even slight, or of any marked inflammatory condition of tubes or ovaries, constitutes a positive bar to the use of a pessary. Under these conditions, however, by placing the patient in the knee-chest position and packing the vagina carefully with absorbent wool, the adhesions may be placed upon the stretch and sometimes finally absorbed, and inflamed and prolapsed ovaries and tubes supported so that after a



few weeks of careful use of this packing the pessary can be safely and advantageously introduced. The wool should be removed on every third or fourth day, and an antiseptic douche given before a fresh tamponade is introduced.

If the case fails to progress properly, and especially if for any reason the parts are too tender, or the abdominal walls too rigid or thick, to enable the surgeon to satisfactorily determine the conditions present, an anesthetic should be administered.

**OPERATIVE TREATMENT.** Although many operations for the relief of retroversion and retroflexion have been devised, but two deserve consideration. None of the operations through the vagina have proven at all satisfactory, but what are known as "ventral suspension," by which the fundus of the uterus is attached to the anterior abdominal wall, and "shortening of the round ligaments," are fairly satisfactory operations.

**VENTRAL SUSPENSION** is performed as follows: A short incision is made midway between the umbilicus and pubes. Through this a finger is introduced and the condition of the appendages ascertained and any existing adhesions separated. The fundus of the uterus is then caught with a bullet forceps and

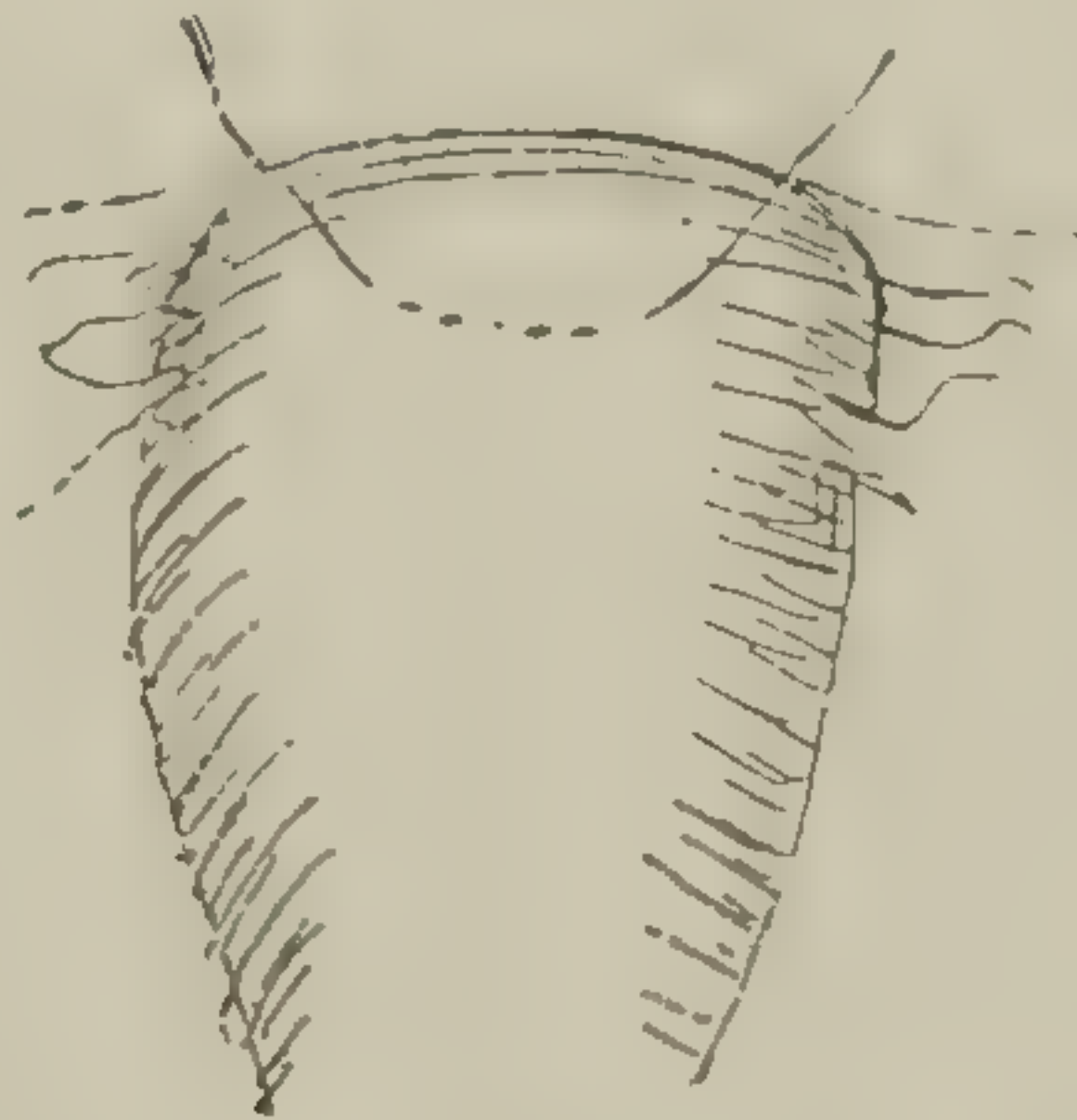


FIG. 110. Showing silver wire introduced at the fundus for ventral suspension.

brought into view, the patient being preferably in the Trendelenburg position. A curved needle threaded with a silk ligature carrier is then carried through the anterior uterine wall just below a line connecting the cornua. The needle should be made to embrace a depth of about a quarter of an inch, and from one-half to three-fourths inch in width. The carrier being in place the silver wire is passed, the ends of the wire being brought out through the



abdominal incision. A finger of the operator is then introduced to determine the position of the bladder, and this being found a handled needle with an eye in the point is thrust through the abdominal wall just above the pubes and a little to one side of the median line. One end of the silver wire is threaded into this needle, which is then withdrawn, re-introduced at a corresponding point on the other side of the median line, and the other end of the silver wire withdrawn. Before tightening the wire, so as to bring the fundus in contact with the abdominal wall, with the

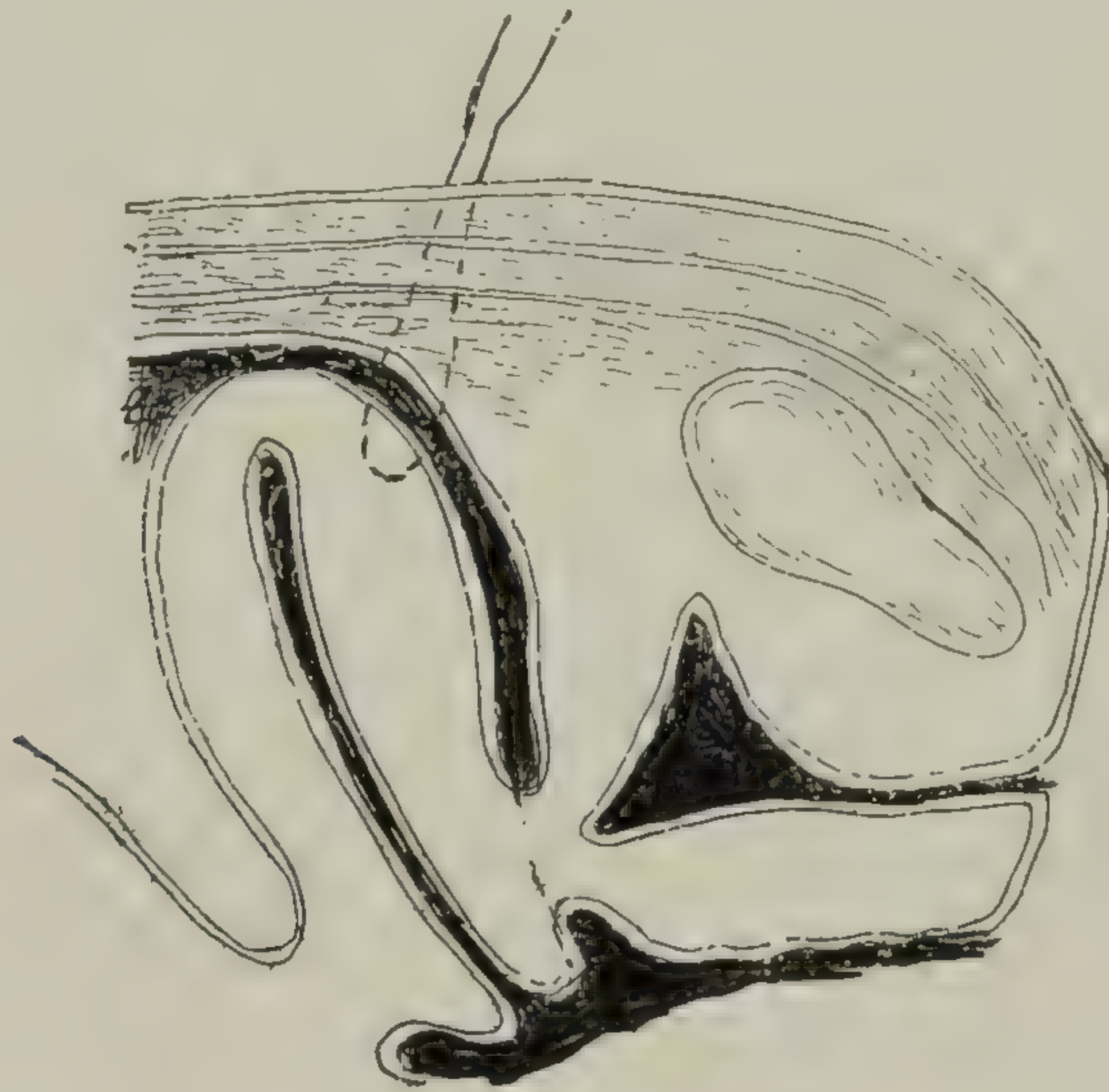


FIG. 111. Ventral suspension. The silver wire is shown inserted, but not tightened. When tightened the layers of peritoneum will be brought into contact so that adhesion may take place.

needle as a scarifier the uterine tissue embraced in the silver wire and immediate vicinity, including a strip extending down the anterior wall, and also a corresponding strip of the parietal peritoneum, should be lightly scarified. Any blood that may have oozed out having been removed, the wires should now be twisted over a little roll of iodoform gauze placed between them. If the uterus is quite heavy, it is well to pass two wire stitches. The uterus is thus held snugly against the abdominal wall and well below the incision, which is then closed in the usual way, the omentum having been carefully drawn down and dropped behind the uterus.



Adhesions at once form between the uterine and parietal peritoneum, not only at the point of principal contact of the fundus, but also down the anterior wall. The silver wire should be withdrawn at the end of two or three weeks, the time of its withdrawal depending somewhat upon the weight of the womb. If this organ is heavy the wire should be allowed to remain fully three weeks. In the course of a few months after this operation it will be found that the adhesions supporting the uterus are so stretched that the organ has sunk into almost its normal position, being suspended by a web of tissue which might appropriately be called a meso-uterus. If no scarification is made, or if the scarification is limited to the region immediately around the wire, a single cord-like adhesion will result which will finally be stretched out to a length of one and a half to three inches. This cord is somewhat too fragile to be trusted, and at the same time it is possible for a loop of bowel to find its way beneath it and to become strangulated. This is not possible in the case of the web-like ligament which results from the more extended scarification.

The old operation, in which the uterus was firmly fixed to the abdominal wall by denudation of its surface and firm suturing, produced abnormal relationships and unquestionably interfered seriously with the progress of subsequent pregnancies. This is not true of the ventral suspension, which allows the uterus to develop and empty itself as though held only by its normal ligaments.

As most of the cases requiring ventral suspension are complicated by adhesions and disease more or less serious of the appendages, these abnormal conditions should be treated at the same time that the suspension is made.

If the retroversion is the result of a lacerated perineum, perineorrhaphy should, of course, accompany the operation.

Although cases of congenital retroversion are seldom or never cured by the use of the pessary, it is only prudent that this instrument should be given a fair trial before operative procedures are resorted to.



If the uterine retroversion is accompanied by ovarian prolapse, and the ovary cannot be gotten out of the way by placing the patient in the knee-chest position or otherwise, all attempts at using the pessary must be abandoned.

As the patient who is wearing a pessary should be under the continuous supervision of her physician, it is evident that for the poor and thoughtless immediate operation should always be advised.

**SHORTENING OF ROUND LIGAMENTS.** In cases of long standing retroversion it will frequently be found that the round ligaments have become very much attenuated and cannot be prudently utilized. If, however, after opening the abdomen, and

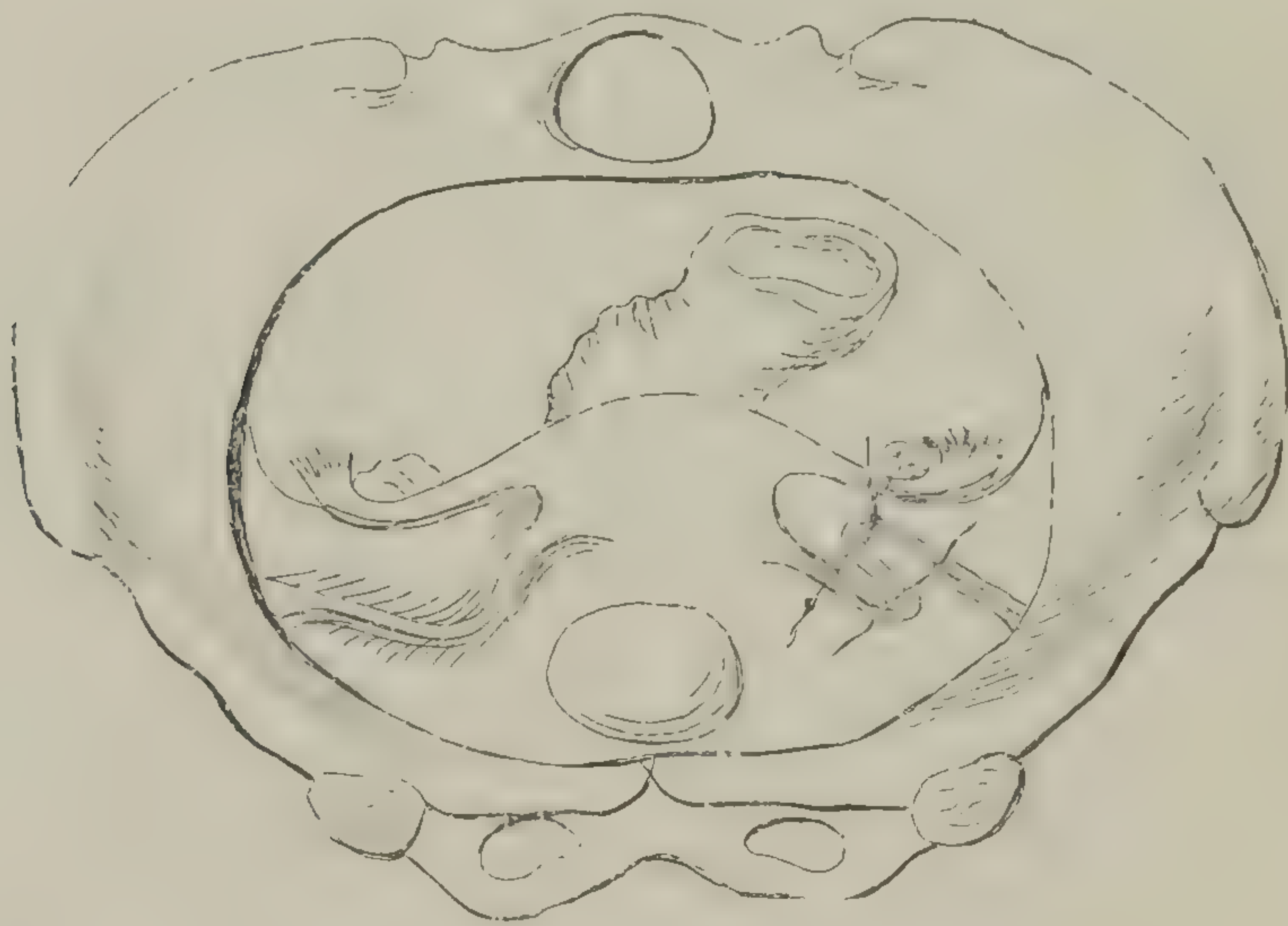


FIG. 112. Showing Mann's method of shortening the round ligaments by folding the ligament upon itself and the introduction of sutures.

treating the pelvic conditions according to the indications present, it is found that the round ligaments are sufficiently strong, instead of a ventral suspension the operator may safely fasten the uterus forward by doubling each round ligament upon itself and fastening it in this position by fine silk or catgut. This method has been used by Mann and others and has proven quite satisfactory. Before inserting the sutures the adjacent surfaces of the ligament must be scarified.



In some cases in which the uterus is not too heavy, and in which the appendages are free from disease and no adhesions are present, the

ALEXANDER OPERATION is most satisfactory and is performed as follows: After shaving and sterilizing the pubes an incision about three-quarters of an inch in length is made downward and inward from a point about two inches above the center of the external ring, and close to the border of Poupart's ligament. The incision should be carefully deepened until the fascia of the external oblique comes into view. The structures are held apart by narrow retractors, a small puncture is made through the exposed roof of the inguinal canal, about one line above Poupart's ligament and about two inches above the middle of the external ring. The canal being thus opened a blunt tenotomy hook is introduced and the contents of the canal drawn up. The ligament itself is then easily separated from its accompanying tissues. Having separated it the loop is seized with the thumb and fingers and the abdominal end drawn out, carefully separating the accompanying tissues as it is drawn through the slit. Although the ligament may be quite small as it first appears, on drawing it out for two or three inches it will usually be found of quite good size and strength. From two to three inches should be thus drawn out and the ligament then fastened by transfixing it with a silkworm gut suture in closing the incision. The ligament should be thoroughly anchored so that it will not yield to subsequent traction when the weight of the womb comes to be suspended from it. The opposite ligament should then be secured in the same way. If the uterus is hyperplastic it should be supported for a few weeks by a properly adjusted pessary, or wool tampons, until the ligaments have become firmly fixed in their new anchorage. Some operators (Kellogg) prefer to fix the drawn out ligament by weaving it back and forth through small punctures made in the fascia of the external oblique. This requires some time for its proper performance and is probably an unnecessary refinement.



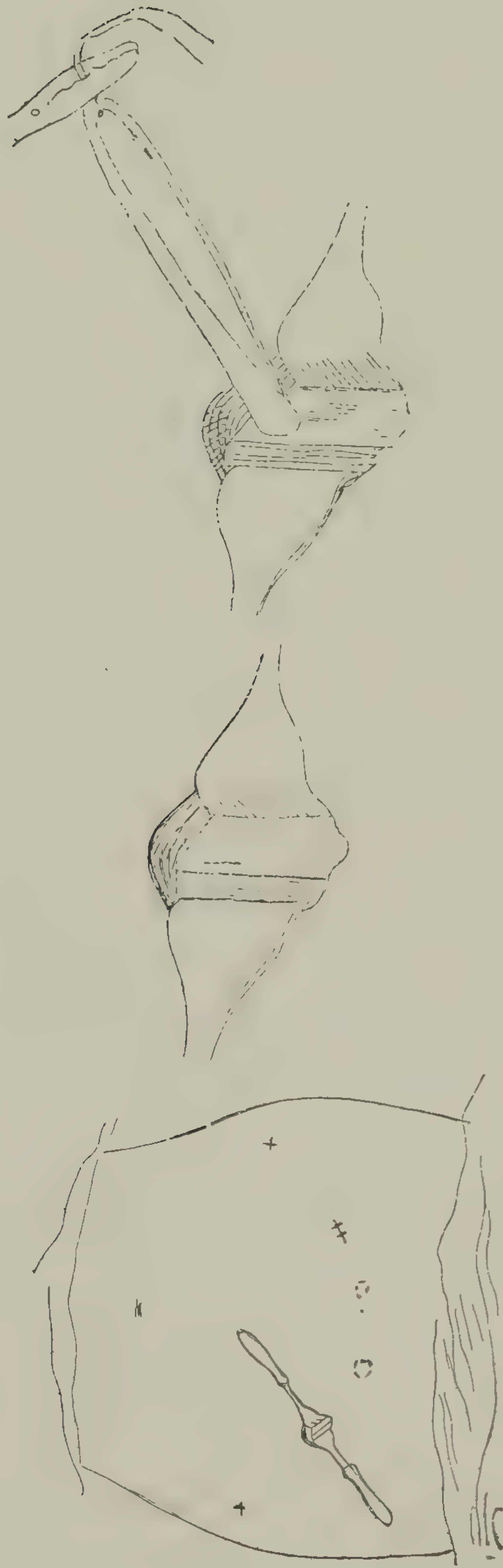


FIG. 113. Diagram showing point of incision for the performance of the Alexander operation. On the opposite side the incision is shown as closed. The retractors expose the roof of the canal, FIG. 114. Retractors showing the roof of inguinal canal, with incision in the same. FIG. 115. Round ligament shown drawn out through incision in roof of canal.



The round ligaments are sometimes found so atrophied as to give way when traction is made upon them. If such an accident occurs the only recourse is a ventral suspension, which should be made at once.

**PROLAPSE OF THE OVARY.** This is a displacement of the ovary toward or into Douglas's cul-de-sac. The prolapse is usually accompanied by retroversion of the uterus, the ovary being drawn down by the weight of the principal organ. Frequently, as a result of local inflammation, the ovary becomes adherent, so that when the uterus is replaced the ovary remains behind. When not due to displacement of the uterus, the mal-position of the ovary may be congenital or the result of a sudden strain. Enlargement of the ovary by inflammation or the development of cysts may result in its prolapse. During pregnancy the ovaries become much enlarged, and if they fail to undergo proper involution may by their weight become prolapsed. Even if the ovary does undergo normal involution its ligament may remain too long and thus permit it to remain displaced.

**DIAGNOSIS.** The symptoms may or may not be marked. In many cases of prolapse the condition is discovered only by accident. In others, however, pain is produced by anything that produces pressure upon the ovary. The pressure between the uterus and sacrum in walking may produce complaint, while dyspareunia is almost always present, and painful defecation. Reflex disturbances are frequently marked. The diagnosis is usually established by bi-manual examination. It is necessary to differentiate it from a prolapsed and distended tube and from the fundus uteri in retroflexion.

**TREATMENT.** If the ovary is non-adherent it may sometimes be replaced by the fingers, or by placing the patient in the knee-chest position. If not too tender, it may be thus supported by a properly adjusted pessary or by a wool tampon. If these means prove inadequate, an operation will be necessary. This will consist in an abdominal section and stitching of the displaced organ, if found healthy, to the upper border of the broad ligament, or its



removal if found diseased. A number of pessaries have been devised for the retention of the displaced ovary, but none of them are of special value. They will do good when the condition is due to a displaced uterus, the retention of which in proper position supports the displaced appendage.



## CHAPTER XXIV.

### INVERSION OF UTERUS.

**I**N this condition the uterus is turned inside out, either completely or partially. The partial inversion tends, however, to become complete. As it presents itself to the surgeon the inversion may be either acute or chronic.

CAUSES. Child-birth is by far the most frequent cause of uterine inversion. If the cord is dragged upon while the uterus is relaxed, inversion can easily result. If the cord is so short that as the child is expelled traction is exerted at the moment of expulsion, inversion will almost inevitably follow. Labor in the erect position and precipitate labors are also given as causes of inversion. When not due to labor, inversion is the result of the expulsion of a uterine polyp or submucous fibroid attached to the fundus.

The improper application of the Crede method of expressing the placenta unquestionably accounts for some cases of acute inversion, the unskilled operator pressing upon the fundus with his finger tips instead of applying carefully the entire hand uniformly to the surface.

Inversion of the uterus of any kind is fortunately very rare. My own experience is limited to two cases. In one there was acute inversion following immediately the birth of the child, so that both child and tumor were between the mother's thighs. The cord was of unusual length and there had been no traction upon the child or pressure upon the fundus. Inversion seemed to be due to the very violence of the last expulsive effort by which the fundus itself, at the moment of relaxation, was drawn after the fetal mass by the partial vacuum occurring as the child slipped out of the vagina. Re-position was accomplished almost instantly, without any special effort, and without the knowledge of the patient that anything was wrong. In the second case the inversion



was of several months' standing and due to the expulsion of a sessile fibroid attached at the fundus. This had been suppurating for some time and had led the attending physician to a diagnosis of cancer. The existence of the tumor was recognized without difficulty. The growth was easily removed, and re-position was accomplished with surprising facility.

**SYMPTOMS.** In the acute form there is usually a considerable amount of hemorrhage and the evidence of great shock. At the same time there appears between the thighs a large bleeding tumor covered by the still attached placenta. The hand of the physician placed above the pubes finds that the uterus itself no longer occupies its normal position. In the chronic form the symptoms do not differ materially from those of the uterine polyp hanging in the vagina. There is abundant leucorrhea, with more or less profuse hemorrhage, and the usual complaints of weight and bearing down, but nothing characteristic.

**DIAGNOSIS.** The only thing for which inversion of the uterus is liable to be mistaken is uterine polyp. Ignorant midwives have, in a number of reported instances, torn the entire



FIG. 116. Showing steps in the production of uterine inversion.

uterus away thinking they were removing an adherent placenta. The same organ has been many times removed when chronically inverted, the operator thinking he was removing a polyp. (See Diagnosis of Fibroids, page 139.)

**TREATMENT.** In acute inversion reduction will be easily accomplished if undertaken within a very short time after the occurrence of the accident. The adherent placenta should be quickly



separated and the fundus pushed back by pressure exerted against it by the fingers placed in the form of a cone. As the fundus yields the fingers should follow the receding part until as re-inversion is accomplished the hand is inside the womb, where it should be allowed to remain until expelled by uterine contractions. Care should be taken to see that each horn is thoroughly pushed out, as otherwise the accident might be repeated. In cases in which the fundus cannot be made to yield to this pressure, the entire organ should be grasped in the hand and pushed back bodily

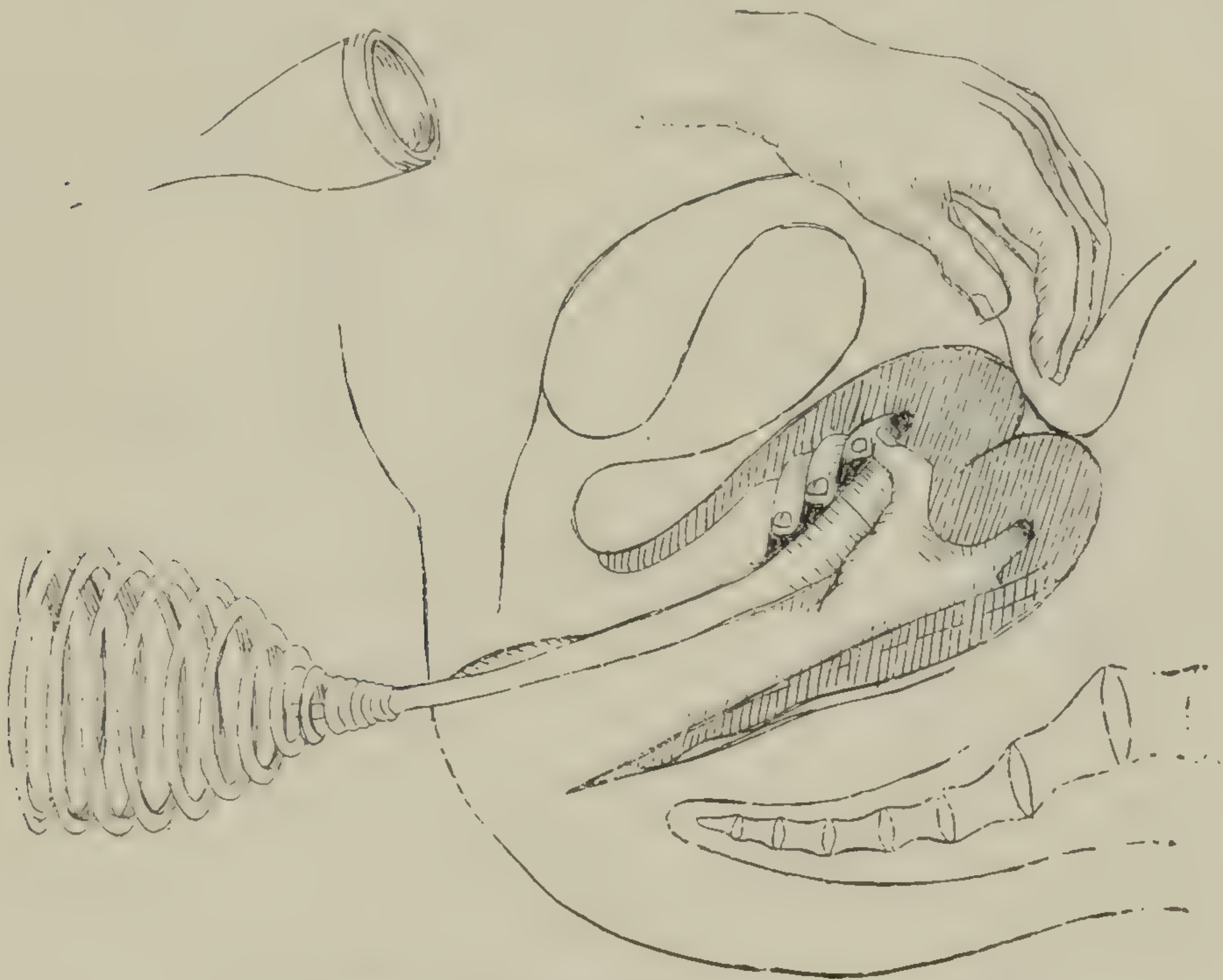


FIG. 117. White's method of securing re-inversion.

through the cervix. In this case the tissues nearest the cervix are first reduced and the fundus itself last. As in the first method, the entire hand will be inside the womb when complete reduction is secured. If several hours have elapsed since the accident, the contraction of the fibers of the cervix will render reduction very difficult. An anesthetic must be given, and the same manipulations as those described above practiced with much perseverance.

When the inversion is the result of the attachment of a fibroid at the fundus, the tumor must first be removed and re-position



secured immediately after. Under these circumstances reduction will usually be found much more difficult than when it occurs as a result of labor. With perseverance, however, unless adhesions have formed above, the reduction will usually be accomplished. If only partial re-position can be secured the entire vagina may be tamponed with elastic wool maintained in place by a T bandage, and a fresh attempt made 24 hours later. White introduced to the profession a wooden block, the upper end of which was cup-shaped, to be applied to the fundus, while to the other end was attached a spiral spring to be pressed against by the body of the operator, who could thus exercise more uniform and continuous pressure than would be possible with the unaided hand. If all attempts at reduction fail, removal of the inverted portion or of the entire organ is the only recourse. If the maternal instinct is still strong, before making a hysterectomy the abdomen should be opened and an attempt made to dilate the cervical ring from above so that re-inversion may be secured from below, the vaginal hand being assisted by counter pressure by the hand in the pelvis.



## CHAPTER XXV.

### GENITAL FISTULAE.

**F**ISTULOUS openings may occur between the genital tract and any of the adjacent organs or structures. Such openings are usually the result of child-birth, but occasionally follow operative procedures or abscesses, and very rarely are congenital. Destructive changes resulting from syphilis or cancer may also cause these openings. An opening between the bladder and vagina is the most common form of fistula. A similar opening may occur between the rectum and vagina. There

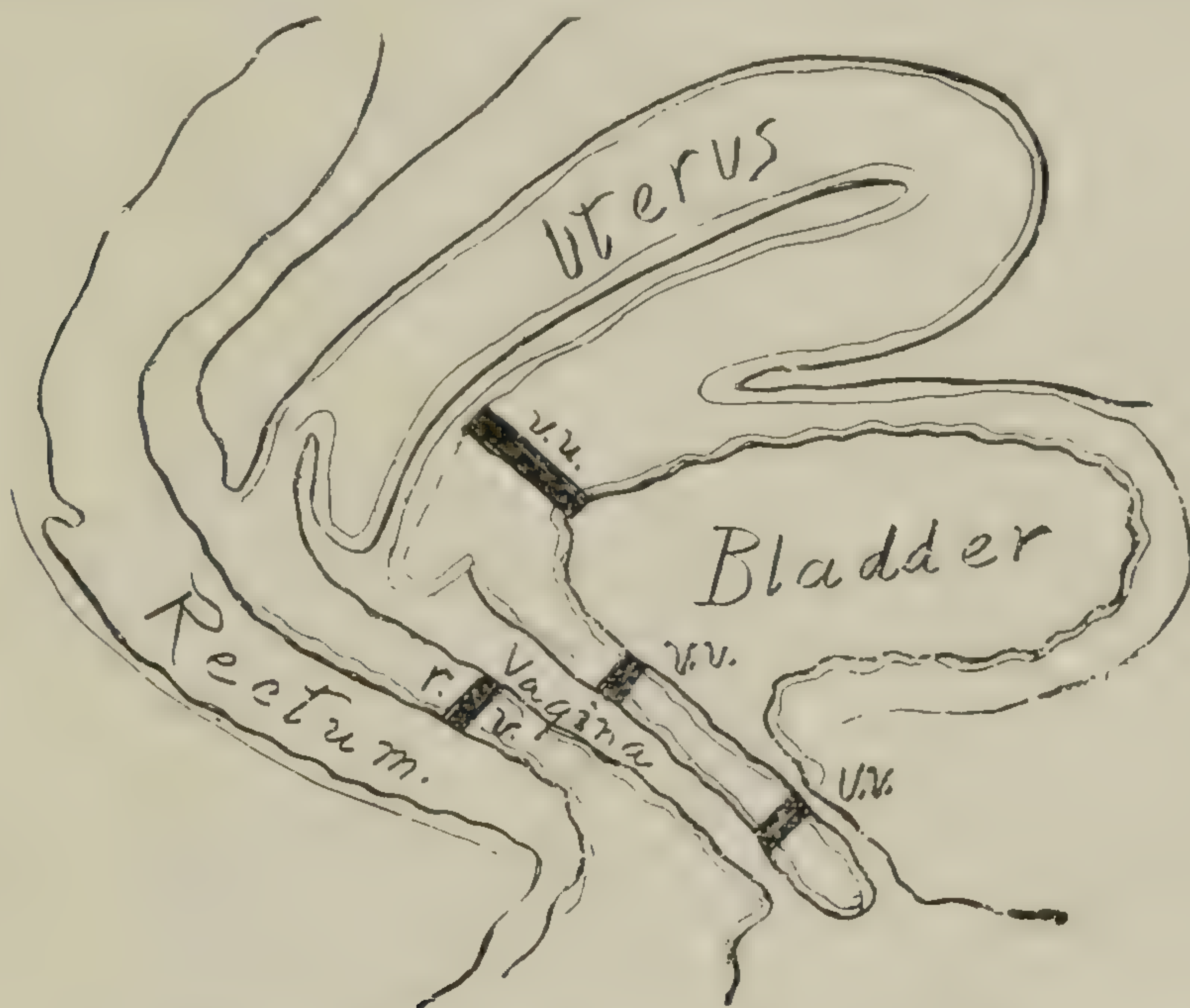


FIG. 118. Schematic representation of different forms of genital fistulae.

may be destruction of tissue between the bladder and cavity of the uterus, so that the urine escapes into the vagina through this fistula, making its exit through the cervix. There is occasional destruction of the inferior wall of the urethra so that while the bladder itself is intact the urine will in part escape into the vagina during the act of urination. As the fistulous openings are the result usually of the long-continued pressure of the child's head in labor, they differ widely in size, location and character. (Fig. 118.)



The escape of urine does not ordinarily take place until several days after delivery, as the opening is not produced until it occurs as the slough separates, usually at the end of about a week. The entire anterior wall may be involved in the slough, so that its place is taken by the collapsed bladder. On the other hand, the fistulous opening may be so slight that its detection requires most careful exposure of the canal and the injection into the bladder of milk or some other colored fluid.

If the opening is small and in the upper portion of the vagina the woman may be able to retain her urine for several hours when on her feet. If, however, it is low down, no urine whatever can be retained. If the ureter has become involved in the slough or injury the symptoms may be very similar to those of an ordinary vesico-vaginal fistula, but on injecting milk into the bladder none of it will be found to escape. This observation, coupled with the fact that the amount of urine passing from the bladder is practically the same as that which comes through the vagina, will establish the diagnosis.

The constant dribbling of the urine over the vaginal surface and thighs soon results in distressing irritation, unless great pains is taken, or even in excoriation with phosphatic deposits around the fistula. Local infection is inevitable, and this occasionally extends through the ureters into the kidneys, producing pyelitis. If of long standing, the non-use of the bladder may result in such contraction as to prove a serious obstacle in repair, and greatly diminish the subsequent usefulness of that viscus.

**TREATMENT.** In recent cases, and in cases in which the opening is small, some delay in operative interference is advisable, in the hope that with rest and cleanliness, with possible stimulation of the edges of the fistula with caustic, the opening may heal by granulation and cicatrization. As soon, however, as it is settled that this hope will not be realized, no further delay is advisable.

In most cases some preliminary treatment is essential, as the irritated condition of the vaginal mucous membrane is not conducive to healing. Hot vaginal douches should be given, and the



vagina distended with absorbent wool covered with vaseline, so as to enable the operator to secure a more thorough exposure, as well as to get the membrane into a more normal condition. If there are phosphatic deposits they should be carefully removed before each application of the tampon. If the urine is alkaline, as is frequently the case, it should be rendered slightly acid by the use of benzoic acid and borax. (Acid benzoic, 2 drams; borax, 3 drams; water, 12 ozs. Sig. Tablespoonful, well diluted, every 4 hours. Emmet.)

As soon as the parts are in proper condition, and this may require several weeks of treatment, an attempt should be made to secure closure by a surgical procedure. The best exposure of the parts is secured by placing the patient in the Sims position, or in the exaggerated lithotomy position. The condition of the parts and size and location of the opening will determine which position is to be preferred. No directions for operation can be given in a work of this size that will meet the varying conditions which will be found in different cases of vaginal vistula. Each case must be studied by itself, and the best method of operating upon it determined by the surgeon in charge. Simple cases are operated upon with ease, but nothing in the domain of surgery will try the skill and resources of a surgeon more completely than will a difficult case of vesico-vaginal fistula.

The first point to be secured is the freshening of the edges of the opening. Two methods are in use for this purpose. In one the entire circumference is denuded by a scalpel, or scissors, in such a way that the larger portion of the tissue removed is taken from the vaginal aspect, so that the edges are beveled at the expense of the vaginal mucous membrane. This gives a broader surface for apposition when the stitches are inserted, and also pushes the bladder mucous membrane somewhat into the bladder, so as to make the line of contact less likely to leak. In the second method no tissue is removed, but the entire edge of the opening is split with scissors, or curved scalpel, so that the bladder and vaginal mucous membranes may be separated. This



procedure is somewhat more difficult usually than the first, but has the advantage of giving a still wider surface for apposition.

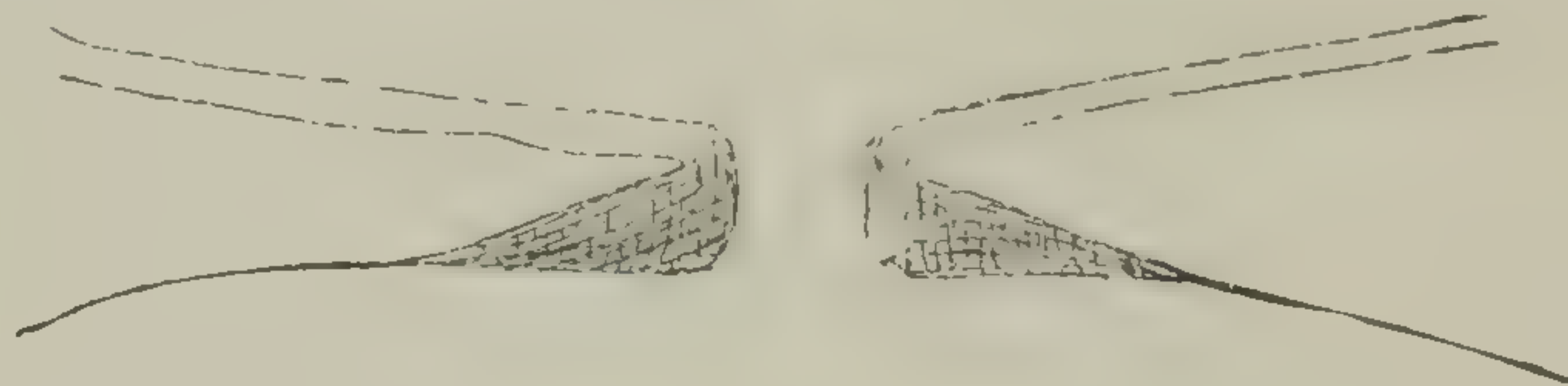


FIG. 119. Showing surface to be removed in denuding for closure of the fistula.

Moreover, no tissue is removed, so that if the operation fails in whole or in part the opening is no larger than at first. In intro-

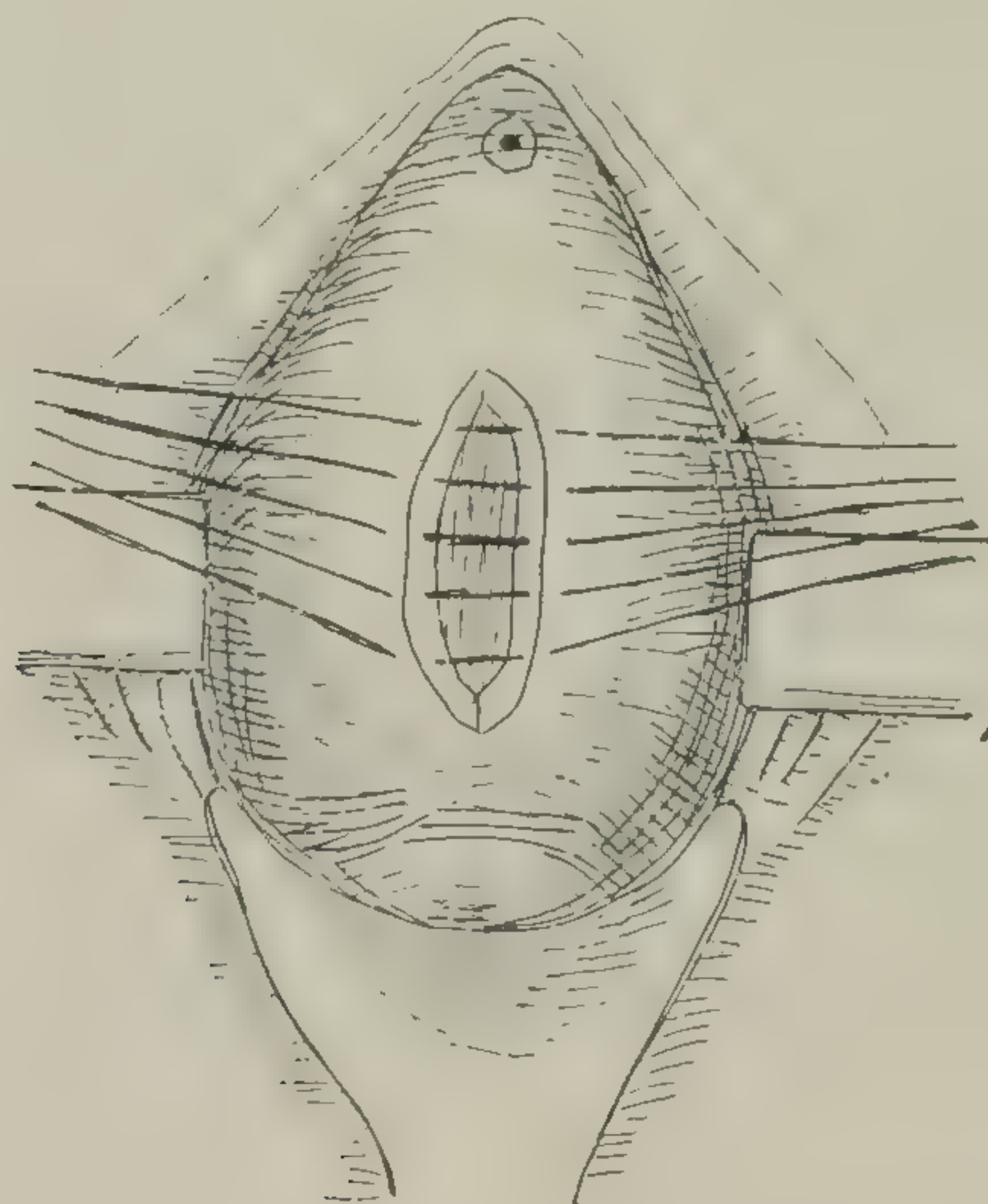


FIG. 120. Showing insertion of sutures in closing the fistula.

ducing the stitches, rather short, half-curved needles should be used. The needle should be inserted about two lines from the edge of the freshened surface and carried through so as not to pierce the bladder mucous membrane. It is then passed across the opening and brought out in the reverse order on the opposite side. Stitches should be inserted at close intervals, so as to secure accurate apposition. Although Sims, who secured his wonderful reputation through his successes in operating on these cases, used exclusively silver wire in closing the opening, modern operators as a rule have found this in no way superior to silk, while it is not so easily introduced. The stitches having been tied, or shotted if wire has been used, the vagina should be lightly packed with



gauze and a catheter fastened in the bladder. If all goes well the packing need not be disturbed for a week or ten days, but if it becomes soiled by uterine or vaginal secretions, it should be removed, the vagina douched, and packing renewed.

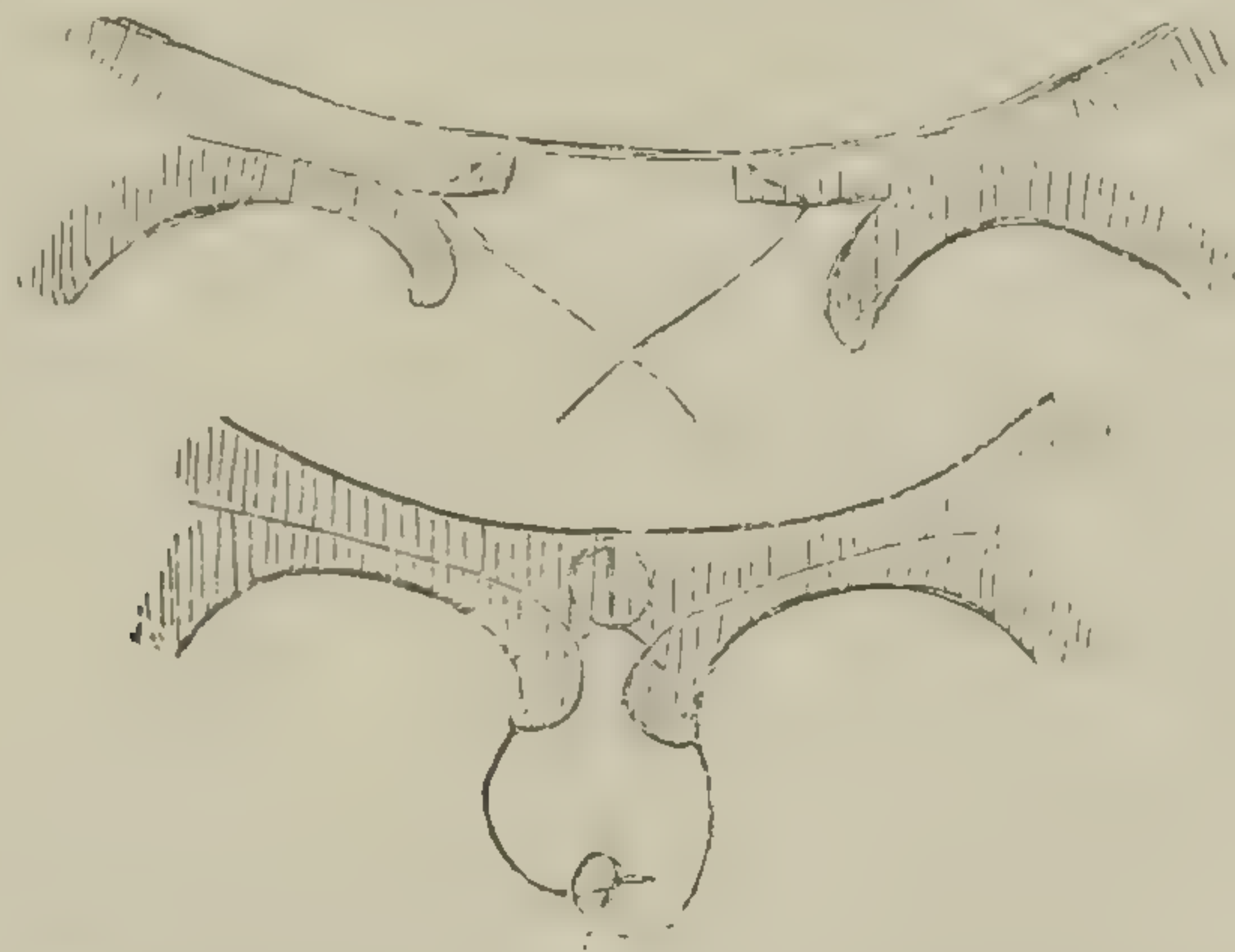


FIG. 121. Showing flap-splitting method of operating, with insertion of the suture for closing the flaps.

In cases of large fistulæ it will frequently be necessary to freely incise the lateral walls of the vagina so as to secure apposition of the freshened edges without undue tension. In very bad cases it may be even necessary to separate the bladder itself very widely from its vaginal attachments, so that by sliding it over the opening may be closed.

In place of the usual needle and needle-holder, a delicate curved needle, with handle attached and a hook near its point, will sometimes be found much more convenient. (Fig. 52.)

In cases in which the opening is just above the neck of the bladder, it will be advisable, after closing the opening as above described, to temporarily paralyze the sphincter vesicæ by overstretching it, as otherwise the contractions of this muscle will be very apt to interfere with union.

With the more wide introduction of the obstetrical forceps, and a diffusion of knowledge of its proper use, there has been a great diminution in the number of cases of vaginal fistulæ throughout the entire civilized world, so that the number of cases which any one operator meets with in a single year will be necessarily quite limited.



In those deplorable cases, fortunately excessively rare, in which, owing to the size of the opening, its closure is absolutely impossible, the only recourse is closure of the vaginal outlet so as to throw vagina and bladder into one receptacle. This operation, known as *kolpokleisis*, is performed by removing a wide strip of mucous membrane entirely around the lower end of the vagina and bringing the apposed surfaces together by the introduction of sutures. Owing to the ill results which almost inevitably follow, due to the presence of the uterine discharges and urine in this common receptacle, the operation has been quite generally condemned by eminent authorities. It is possible, however, that this objection could be overcome by a preliminary hysterectomy, although necessarily, owing to the risk of infection from the proximity of the urine, this latter operation would under such circumstances be unusually hazardous. The condition, however, of a woman with such an opening is so deplorable that she would cheerfully undertake any reasonable risk.

There does not seem to be any trouble arising from the use of the vaginal mucous membrane as a receptacle for urine. This was admirably shown in a case, in the writer's practice, in which in an otherwise well-formed young woman there existed a congenital absence of the urethra. In this case the sphincter *vaginæ* was so developed that the patient was able to retain her urine for several hours in the bladder and vagina, which thus came to constitute a common receptacle. The peculiar condition present was recognized during life, and was verified at the autopsy, death having resulted from tuberculosis of the kidneys.

The treatment of other forms of vaginal *fistulæ* is to be conducted along the same general lines as those indicated above. In cases of recto-vaginal fistula in which the fistulous opening is low down, it will many times be best to incise the intervening perineum, dissect out the fistula, and close the gap as though originally a ruptured perineum.



## CHAPTER XXVI.

### APPENDICITIS.

**W**HILE operations for appendicitis unquestionably belong to the field of general surgery, the gynecologist is frequently called upon to operate in these cases, either when the disease occurs as an uncomplicated inflammation, or as he finds it as a complication when operating on fibroids or pus tubes, or other conditions requiring abdominal section.

For the consideration of the general subject of appendicitis the reader is referred to the general works on surgery, or to the one or two special works upon this subject which can now be obtained. A brief description of the operative technique is all that is appropriate in this connection.

Owing to its anatomical relationship to the tube and ovary, the appendix is quite frequently found involved in an inflammation either preceding or following, as cause or effect, inflammation of the appendages on the right side. Moreover, even when not consecutive to pelvic disease, the appendix is so frequently the seat of catarrhal thickening that it is a matter merely of prudence to examine this little organ whenever the abdomen has been opened, and remove it if diseased.

**THE INCISION.** Under ordinary circumstances the gynecologist will operate on the diseased appendix through the incision which he has made for the relief of pelvic conditions. If, however, he is operating primarily on the appendix he will make his incision preferably over the diseased organ. If he is operating on a case of catarrhal appendicitis, the incision will be short and the muscular fibers merely separated instead of incised, after the manner of McBurney. If, however, the case is one in which from the history of repeated attacks extensive and firm adhesions are expected, or if the case is an acute one with or without the presence



of pus, a longer incision will be necessary, which shall sever all the tissues down to the cavity.

THE APPENDIX. If there is no pus present, the appendix should be found, adhesions separated with the fingers, aided occasionally by a snip of the scissors, and the organ brought up into

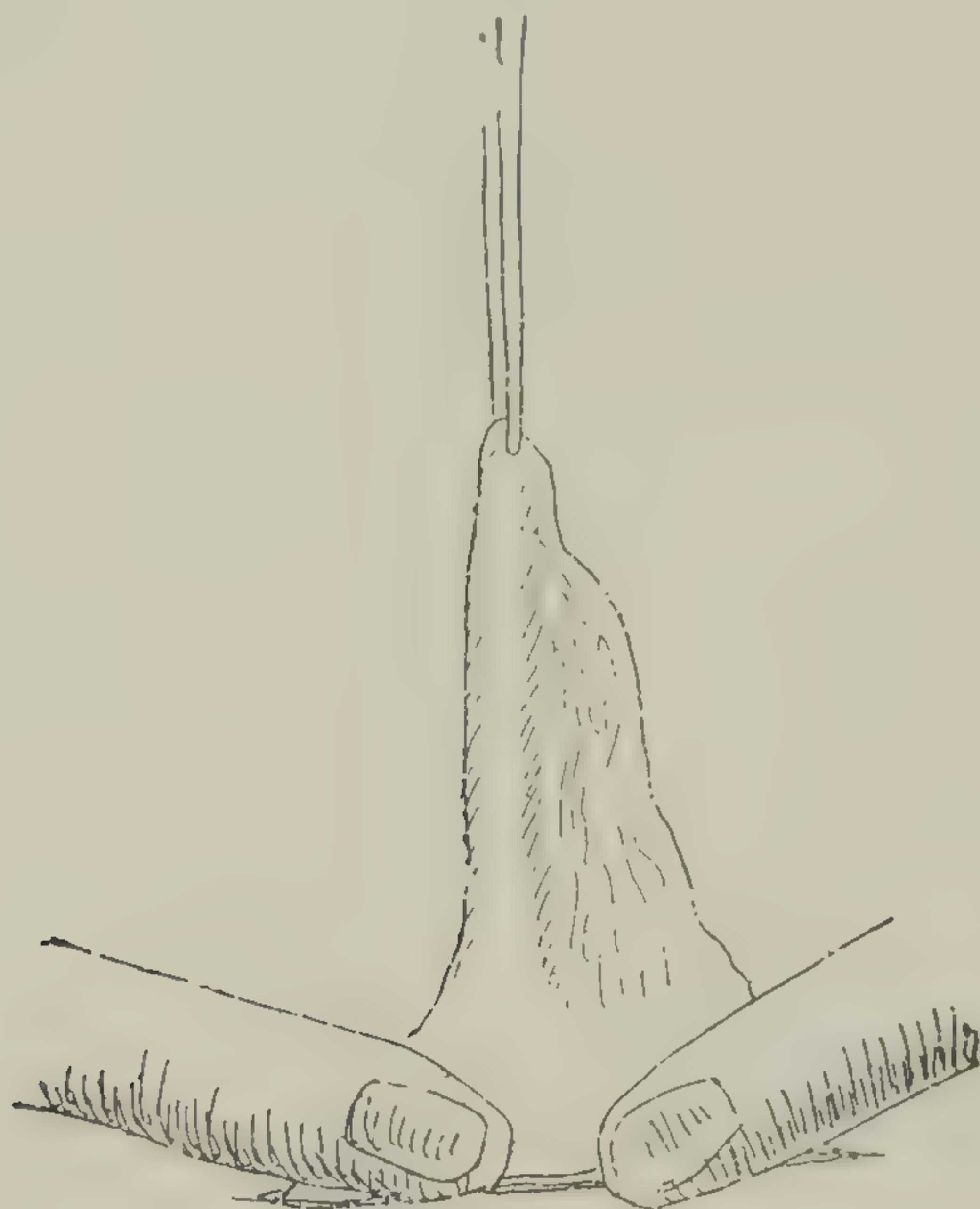


FIG. 122. Showing appendix drawn up into the incision and the tissues at its base held by the fingers of an assistant. The fingers should be represented as having their tips in contact.

the wound. The meso-appendix should be transfixed close to the gut, ligated with fine silk or catgut, and freed from the appendix. The assistant now seizes the bowel, well below the attachment of the appendix, between the thumb and fore finger of each hand. It is held in such a way that none of the contents of the bowel can escape when the appendix is removed. With scissors curved upon the flat, the appendix is next cut off so as to leave an elliptical opening in the colon. Any fecal matter which appears in the wound should be carefully wiped out, and the opening closed with fine catgut passed through the muscular and mucous coats. This should be a continuous suture. After tying the thread, the line of suture should be sterilized by the application of a drop or two of pure carbolic acid. This first line of suture should then be pressed



down into the gut with a probe, and as the peritoneal surfaces come together over it they should be united by a continuous Lembert suture of fine silk or catgut. This suture should be so intro-

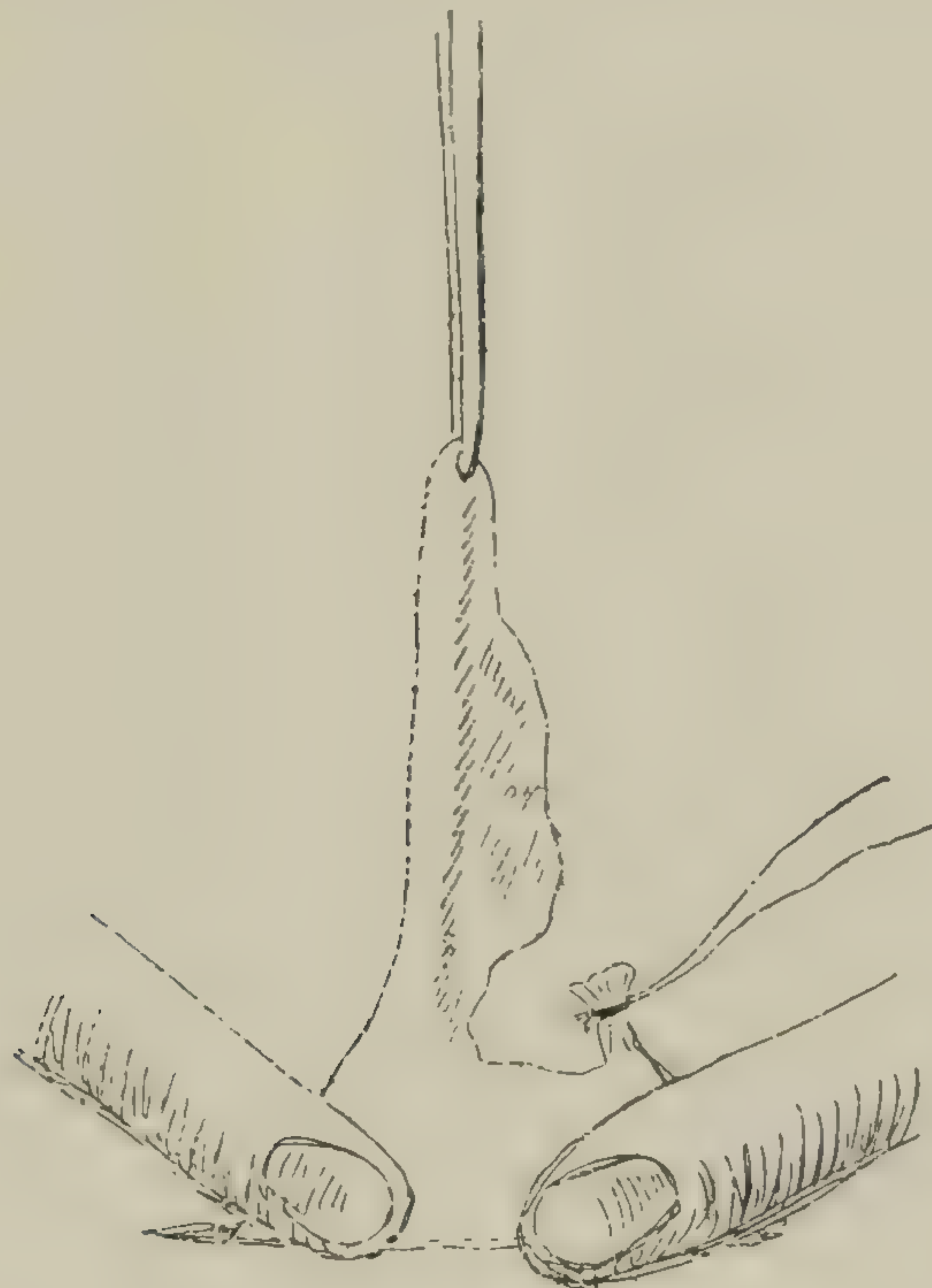


FIG. 123. Meso-appendix ligated and severed ready for the detachment of the appendix. The fingers should be represented with the tips in contact.

duced that it is completed at the upper end of the incision, that is, at the point furthest removed from the meso-appendix. After tying the suture, the previously detached meso-appendix should

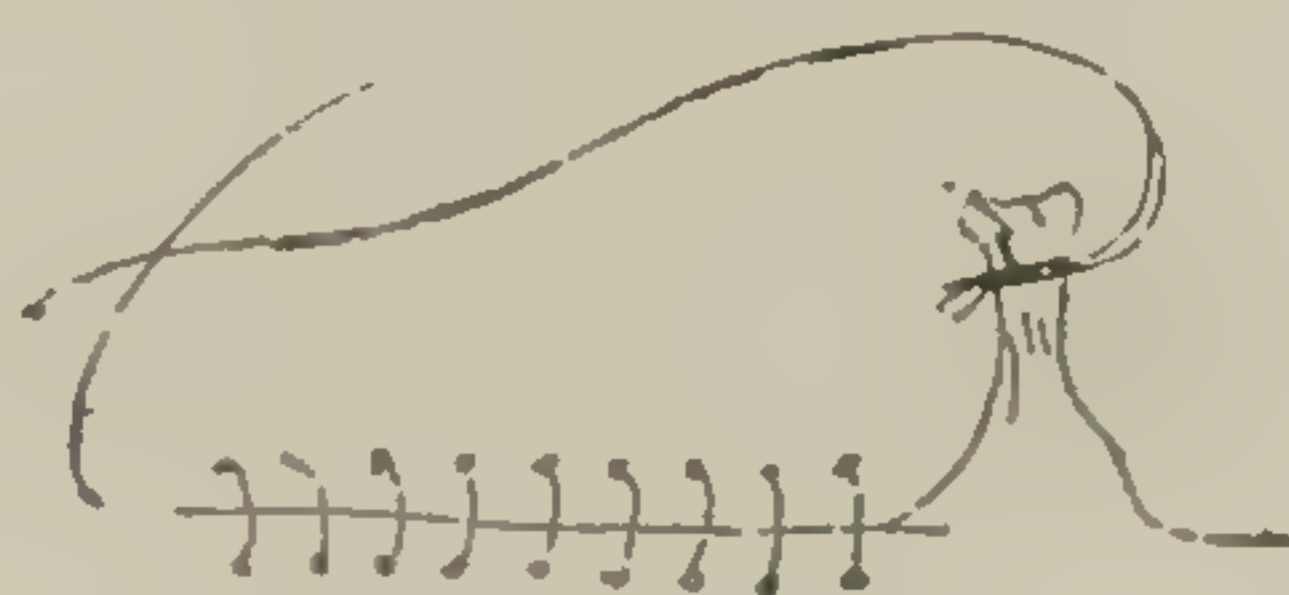


FIG. 124. The Lembert continuous suture closing the peritoneum shown in place and the stump of the appendix about to be drawn over by tying the end of the suture to the ligature.

be brought up by traction on the ligature placed around it, and the ligature and suture tied together so that the meso-appendix covers the line of suture. This application of the meso-appendix is not always possible, but when feasible should be done as an additional precaution.



The field of operation having been wiped clean, the omentum is drawn into place and the wound closed like any other abdominal incision.

PUS CASES. In cases in which pus is present, together with the formation of firm adhesions shutting off the pus cavity from that of the peritoneum, this cavity should be carefully washed out and sterilized as completely as possible. A careful attempt should then be made to find and remove the appendix. In many cases undoubtedly its removal is superfluous, as permanent recovery would take place without it, but as it is impossible to tell in any particular case when later trouble will arise, it is wise in all cases with firm adhesions to attempt its removal. If, however, it cannot be found, or if the adhesions are fragile, it is better to introduce drainage into the cavity, partially close the incision, and allow healing to take place from the bottom. It is better for the patient to take the risk of future trouble from the retained appendix than to be subjected to the hazard of a general peritoneal infection from the breaking down of protecting adhesions.

If the pus present is not in a distinct cavity, but is smeared over the adjacent coils of intestines or incompletely retained by cobweb adhesions, the parts should then be freely exposed and the entire infected surface cleaned by careful sponging. Gauze being then introduced to protect the intestines, the appendix should be removed as previously described. Under these circumstances the coats of the bowel will usually be found quite friable, and the danger of the giving way of the sutures and consequent leaking is great. Even if this does not take place the suture material will almost certainly become infected, and hence only catgut should be used. After again cleansing the exposed intestines, gauze should be lightly introduced both for drainage and also to guard against infection in case of leaking from the intestinal wound.

In many cases, on cutting through the abdominal wall, it will be found that the appendix is bound down by adhesions and is contained in a distinct and usually small abscess cavity, but without any adhesions between it and the abdominal parietes. Under



these circumstances attempted removal of the appendix would necessarily open the abscess, with almost certain infection of the peritoneum from the escaping pus, which under these circumstances is usually most virulent. Before attempting, therefore, to find the appendix or to open the abscess, gauze should be packed around the mass so as to push the intestines away and thoroughly protect the peritoneum. To accomplish this it may be necessary to introduce several yards of gauze. This being properly placed around the field of operation, the adherent coils of intestine should be freely separated and the abscess opened. If the abscess is of any considerable size it is wise to introduce carefully a blunt aspirator needle and draw off the contents before exposing the cavity. The pus having been removed, the cavity should be freely opened, cleaned out and sterilized. The appendix should then be found and removed as previously described. As the field of operation is almost necessarily infected, the gauze protective, which has been previously inserted, should be allowed to remain for four five days, or until adhesions of sufficient firmness shall have formed around it. It can then be carefully removed and a smaller amount re-inserted, and this continued from day to day until the cavity heals from the bottom.

Cases in which free pus exists in the peritoneal cavity, in the region of the appendix or more or less diffused, are the most desperate with which the surgeon deals. If the pus is the result of quite recent infection; if, in other words, the operation is made within forty-eight to sixty hours after the peritoneal invasion, the case is far from hopeless. The percentage of mortality, however, rapidly increases with every hour of delay, and after the lapse of sixty hours the patient is practically moribund, as by this time the infection will have involved pretty much the entire peritoneal cavity.

When the pus is limited to the loops of intestines near the appendix, the peritoneal surface should be carefully sponged clean and dry and the appendix removed as previously described. If, however, the pus seems to be distributed throughout the general



cavity, the entire abdomen should be flushed with a large quantity of normal salt solution. This flushing should be done by means of a rubber tube, or long-nozzled funnel, passed to the deepest parts of the abdomen and pelvis, so that the water in escaping washes from below up. The intestines should be freely drawn out of the incision and subjected to thorough mechanical cleansing. While they are thus largely outside, the cavity should be more thoroughly cleansed, including the fossæ upon each side of the root of the mesentery and the pelvis. The cavity being thus thoroughly cleansed the intestines should be returned, the appendix having been removed, and strips of gauze introduced for drainage in addition to a glass drain passed down into the pelvis. It will frequently be necessary to puncture the intestines for the escape of gas before the distended bowels can be returned to the abdominal cavity. Each puncture should be carefully closed with a single Lembert suture. These cases of general purulent infection, while perhaps not absolutely hopeless, are so desperate as to justify the surgeon in thorough and long-continued flushing and extensive drainage, with repetition of the flushing a few hours later if necessary.

FECAL FISTULÆ will occasionally result in these cases, owing to the giving way of the friable tissues in which the sutures have been placed. Such fistulæ, however, almost invariably close within a few weeks and will, therefore, seldom require any surgical measures for their cure.

HERNIA. In a large proportion of cases in which it is necessary to introduce drainage, subsequent hernial protrusion may be expected. This should be explained to the patient, who should be directed to return for the radical cure of the hernia in case such a condition should develop.

When the appendix is the seat of inflammation in connection with abdominal or pelvic disease, for the relief of which a median incision has been made, it can usually with little trouble be freed from adhesions and brought up into the incision about as easily as through the incision in the usual site. Its removal will



then be accomplished according to the methods previously described.

PURGATIVES. In the cases in which there has been no pus present, constipation for four or five days is desirable in order that sufficient time may be given for the intestinal wound to become firmly closed. In the cases of general peritonitis, however, in which purgation is of importance in order to secure peristalsis and the absorption of any remaining septic exudate, the risk of fecal fistula is of secondary importance, and cathartics should be given at once. As vomiting has already probably appeared, it is wise under these circumstances to introduce the saline purgatives directly into the bowel through a puncture made for the withdrawal of the gas. In this way the drug will be placed beyond the reach of ejection and will more likely accomplish its purpose.



## CHAPTER XXVII.

### DYSMENORRHEA.

**P**AINFUL menstruation is such a common complaint as to attract little attention unless the disturbance is unusually great. Women come to accept it as part of the function and suffer on without consulting a physician. When, however, the pain becomes extreme, advice is generally sought.

The pain may appear with the flow, or precede it by several hours or even several days. It may cease with the beginning of the flow, or continue for some time after its commencement, or through the entire period, and even for some time after it has ceased. In pronounced cases, indeed, the woman may be found hardly free from pain for more than a week of the month.

Four varieties of dysmenorrhea are usually recognized:—First, neuralgic; second, inflammatory or congestive; third, mechanical; fourth, membranous.

NEURALGIC DYSMENORRHEA is of constitutional origin. The sufferers are usually women of a highly neurotic temperament, or those who present evidences of malnutrition. Anemia, hysteria and neurasthenia will usually be found present and more or less marked, or the rheumatic diathesis may be the predisposing factor. In these subjects the pain is generally quite irregular from month to month. It frequently is found to radiate from the region of the uterus to the abdominal and lumbar regions, and sometimes down the thighs. Hyperesthesia of the pelvic viscera is sometimes a noticeable feature. On examination little or nothing can be found locally to account for the pain, while the character of the flow itself may be entirely normal. Treatment must be directed to the general condition.

INFLAMMATORY DYSMENORRHEA is the result of congestion or inflammation affecting some part of the uterus or its appendages. This form of dysmenorrhea is frequently the result of some temporary cause, such as over-exertion or exposure to cold.



When the condition is persistent it will be found attended with inflammatory affections of the ovaries and tubes or endometrium. The pain is inflammatory in type and usually is noticed in the spine and down the limbs as well as in the pelvis. The free establishment of the flow ordinarily gives relief of the symptoms. The treatment must, of course, correspond with the local pathological conditions found.

MECHANICAL DYSMENORRHEA is a result either of a lack of proper development of the uterus or its appendages, or of some fault of position. Contraction of the cervical canal at either the external or internal os is occasionally found. This contraction, when at the internal os, is usually the result of sharp flexion, though this form of stenosis is not so frequent as one would expect from the literature on the subject. If the external os is contracted this should be dilated, with multiple incisions if necessary. Contraction of the internal os is relieved by straightening the co-existing flexion by thorough dilatation. It may be necessary to repeat this dilatation a number of times.

MEMBRANOUS DYSMENORRHEA is that form in which at the menstrual period a more or less complete cast of the uterine cavity is expelled. Practically nothing is known of the cause of this condition. The treatment of it is exceedingly unsatisfactory, although dilatation and curetting of the endometrium will usually afford considerable relief; will sometimes, indeed, effect a satisfactory cure. Repeated curettings may be necessary.

In extreme cases of dysmenorrhea, in which constitutional and local treatment have failed to give relief and the life of the sufferer has become a burden to herself and friends, removal of the appendages is clearly indicated. When that is done a careful examination of the ovaries will generally show some abnormality of development or some distinct pathological condition.



## CHAPTER XXVIII.

### MALFORMATIONS.

THE development of the uterus and its appendages from the Wolffian's tubes and Muller's ducts may proceed irregularly, or cease at any point. As a result we may have absent or imperfectly developed ovaries and tubes, and absent or



FIG. 125. Muller's ducts. (Schematic.)

rudimentary uterus; or only one-half of the uterus may be developed, constituting the one-horned uterus, or uterus unicornis; or

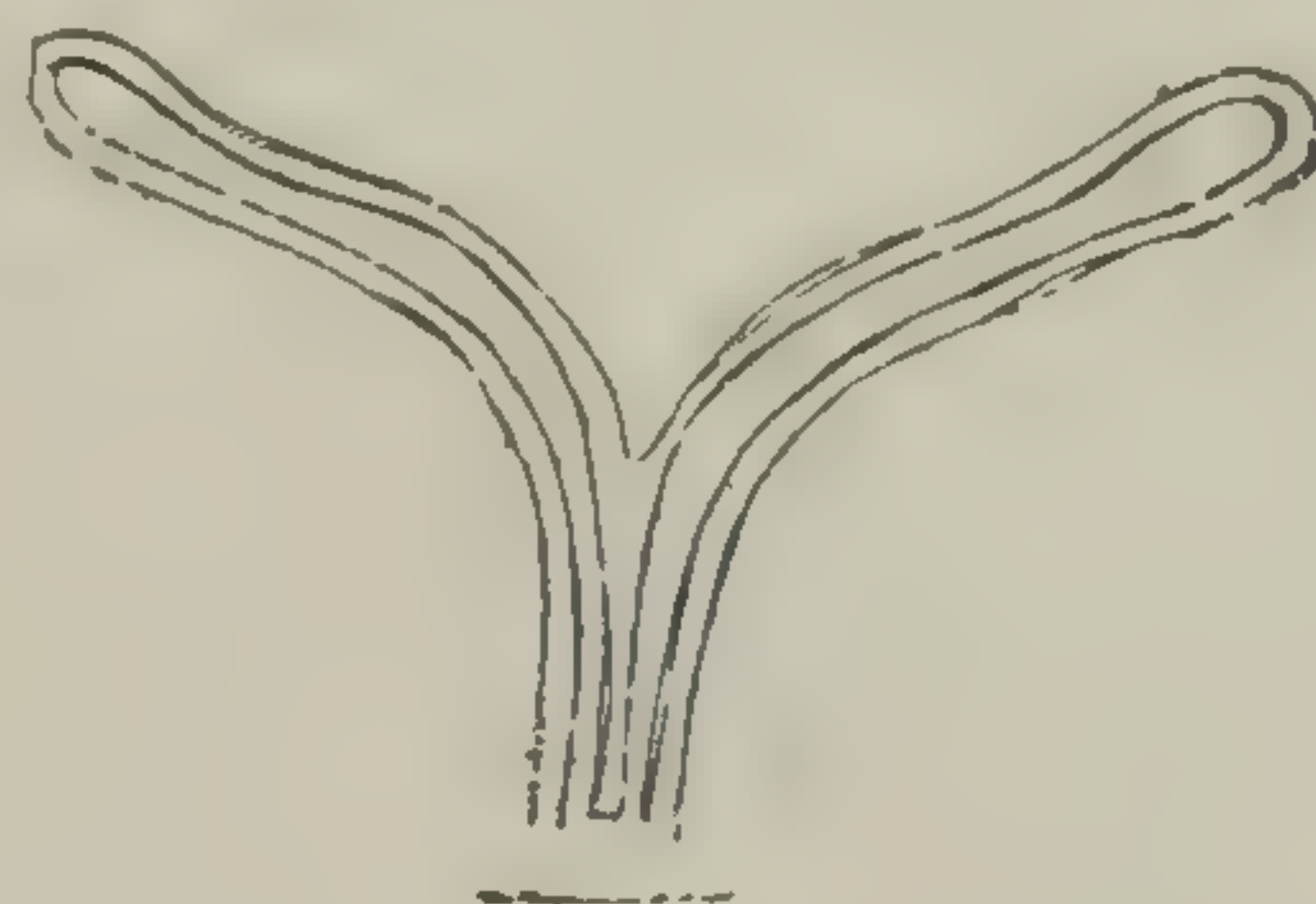


FIG. 126. Coalescence of ducts.

the body of the uterus may be imperfectly united, giving the two-horned uterus, or uterus bicornis. The uterus may be double



FIG. 127. Disappearance of the septum.

throughout, the uterus duplex, or it may be divided by a septum into two chambers, the uterus septus. In the case of the double



uterus there is but a single ovary and tube attached to each. The failure of the two halves to unite occasionally extends throughout the entire canal, giving a double vagina in addition to a double uterus. These malformations are fortunately rare and are usually discovered by accident when the surgeon is investigating the

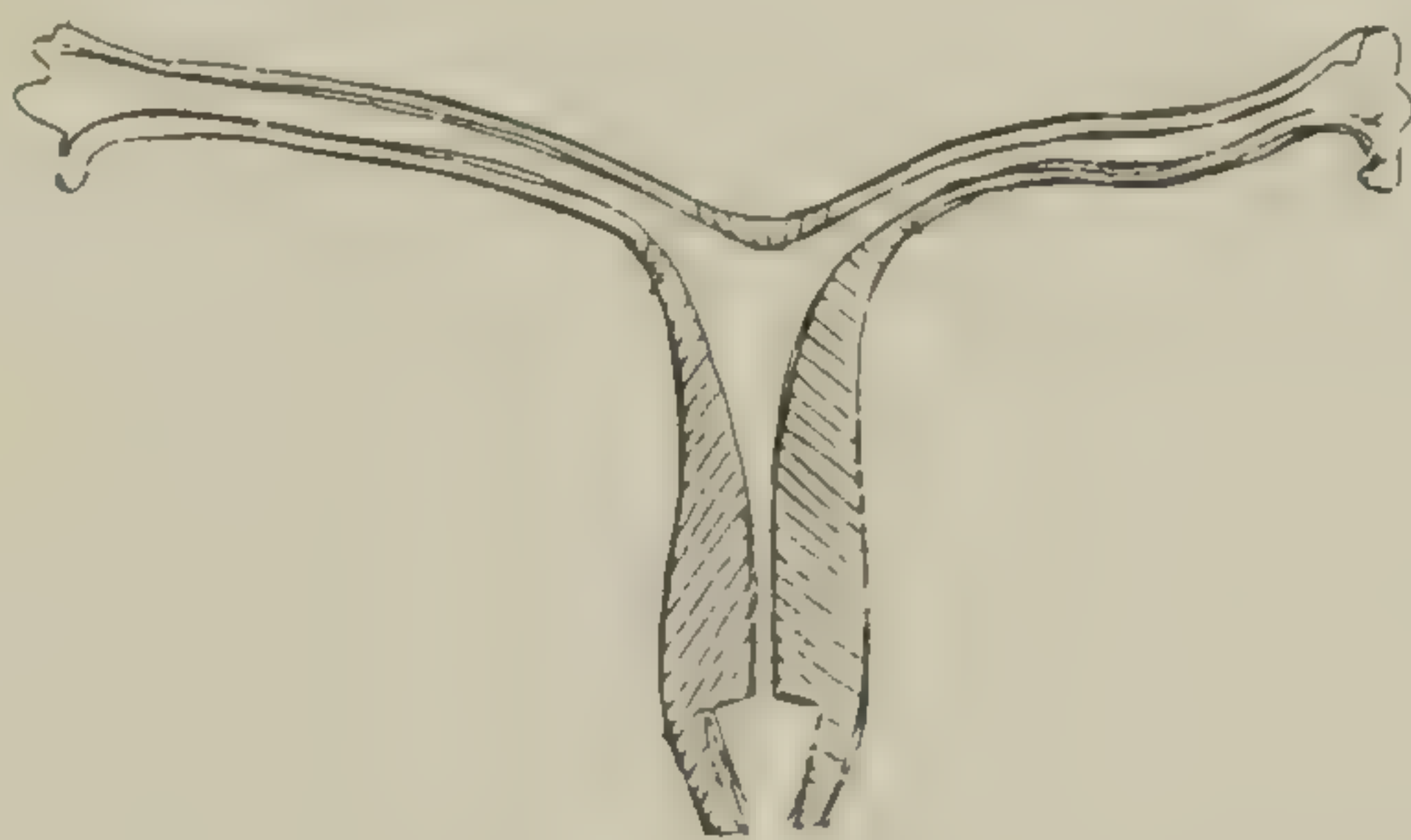


FIG. 128. Formation of fundus and cervix.

causes of dysmenorrhea or sterility. While the double uterus is usually sterile, cases have been occasionally reported in which pregnancy has occurred in one half or in both. In the latter event, impregnation and subsequent delivery in each side taking place independently and at perhaps considerable intervals, these cases are sometimes reported as instances of superfetation.

Treatment, when once the condition is recognized, is usually uncalled for. The condition of the undeveloped uterus may occasionally be improved by repeated dilatations and the local use of electricity. Beneficial results, however, will only seldom follow such interference. As dysmenorrhea usually accompanies some of these forms of undevelopment, castration will sometimes be found necessary to effect a cure.

**HYPER-INVOLUTION.** While this is not a congenital defect of development, it may be appropriately described in connection with such malformations. In this condition the process of normal involution seems to have been carried too far and to have resulted in the atrophy of the uterus and its appendages. The condition is fortunately an excessively rare one, and its causes are practically unknown, although the condition is usually attributed to excessive hemorrhage in child-birth or prolonged lactation. Amen-



orrhea and the other phenomena of the climacteric result, and except for the age of the patient the condition, indeed, is the same as that which normally occurs later in life. The treatment should be such as will place the general health of the woman in the best possible condition, but the prognosis is entirely unfavorable.

CERVICAL EROSIONS. While not directly a malformation, erosions of the cervical mucous membranes are sometimes found apparently congenital in character. When thus congenital, the eroded mucous membrane seems to be a direct continuation of that lining the cervical canal. Though usually quite limited, it sometimes covers the greater part of the cervix, giving rise to more or less cervical leucorrhea with its accompanying symptoms. This erosion is sometimes accompanied by malformation of the external os simulating somewhat a laceration of moderate extent. Indeed, so closely may this condition simulate laceration as to render differential diagnosis quite difficult, or perhaps impossible. The erosion, however, will be found to embrace the cervix quite uniformly instead of being limited to a single strip, as in cases of laceration. Congenital split of the cervix, however, is sometimes found in cases in which there are no erosions whatever. The diagnosis can usually be established in these cases from the absence of other symptoms which usually accompany laceration of the cervix, one of the chief of which is the condition of subinvolution.

As the congenital erosion of the cervix is due to incomplete development of the mucous membrane, the only treatment, when the symptoms are so marked as to necessitate it, is amputation.

The cervix is sometimes found entirely closed, either as a congenital malformation or as the result of adhesive inflammation. It is usually possible to determine the location of the occluded canal and to restore its patency by puncturing with a trocar and the persistent use of dilators.

OVARIES AND TUBES. The ovary is seldom entirely absent, but it is not very infrequently found in a rudimentary and undeveloped condition. When undeveloped its presence is probably



merely negative, but it frequently is so far developed as to have a certain amount of functional activity. Under these circumstances it may be a source of distress until the condition is recognized and the organ removed.

The ovarian stroma, instead of being gathered into a distinct mass, is sometimes spread out more or less widely through the broad ligament. It is this diffusion which probably is the explanation of continuance of menstruation, and even of child-bearing, after the removal of both ovaries.

Malformations of the Fallopian tubes are rare, but the tube is sometimes found either as a mere fibrous cord along the border of the ligament or twisted upon itself, as in the infantile state of development. Malformation of the tube is usually an accompaniment of malformation of the uterus.

The diagnosis of undeveloped ovaries can frequently be suspected from the history of the case. If the subject has thin abdominal walls it will sometimes be possible, under an anesthetic if necessary, to ascertain the condition by palpation, especially if the uterus is drawn down and the examining finger introduced into the rectum. Malformations of the tubes cannot under ordinary circumstances be diagnosticated.

Treatment of these conditions is purely operative. If the undeveloped ovary is such a source of pain as to seriously interfere with the health and happiness of the patient, removal should be unhesitatingly advised.

VAGINA. As previously stated, the vagina is occasionally found double in cases of double uterus.

Its entire absence or rudimentary development is rarely noted.

If this absence or rudimentary condition be connected with non-development of the uterus, its presence may not be recognized until absence of menstruation leads to an examination. If the uterus and appendages are normally developed, however, menstruation will come on but no discharge will appear if the vaginal atresia is complete at any point. As a result of this ac-



cumulation of blood there will be a distension of the uterus until a tumor is formed of appreciable size. Not infrequently the development of this tumor results in a suspicion of pregnancy. Careful examination will lead to a discovery of the atresia.

If this atresia is limited to the hymen, as is most frequently the case, a free incision should be made and the accumulated blood removed by the use of a sterile hot-water douche. If the lower portion only of the vagina is occluded it is still possible, by having an assistant introduce one finger into the rectum and another into the bladder, to dissect between by a transverse incision until the vagina is reached. If when this is done the vaginal walls can be brought down and attached to the skin, the patency of the canal will be easily maintained. In cases of complete atresia, the same operative procedure may be resorted to, but it will be almost impossible to prevent re-closing, as cicatricial contraction ensues. An attempt should be made, however, to keep the canal open by the persistent wearing of a glass plug. If this is objectionable, it will be necessary to open the abdomen and remove the appendages in order to put a stop to menstruation, or even to remove the uterus itself that there may be no secretions whatever, when the artificial vagina may be allowed to close.

As a result of prolonged or instrumental labor there is sometimes extensive sloughing of the vagina, resulting in cicatricial atresia of that canal. If extreme the existence of this atresia will be noticed within a few weeks after the confinement. Most frequently, however, it is not so marked as to have attention called to it until its existence is found to interfere with the progress of a succeeding labor.

Under these circumstances, free incisions will ordinarily give sufficient room for the birth of the child. If the contraction is too extreme, however, for delivery to be thus effected, nothing remains but delivery by means of the Cesarean section.

THE HYMEN. Except for its imperforation, previously noted, malformations of this organ requiring any attention are exceedingly rare.



THE VULVA. Malformations of the vulva are usually accompanied by more or less extensive malformations of the perineum. It may be entirely absent, or the external genitalia may be perfect but with no opening whatever. The downward growth of the perineal septum may be interfered with, in which case the rectum and vagina form a common cloaca. The anterior wall may be imperfectly closed, so that the urethra and base of the bladder appear as a common opening at the vulva. The anterior wall of the urethra may be defective, constituting the condition of epispadias. When in an exaggerated form there is also a partial absence of the pubes and a resulting extrophy of the bladder.

In most of these conditions little can be done in the way of treatment. In the less aggravated varieties, however, some form of plastic procedure may result in marked relief.

There is sometime great hypertrophy of the clitoris. In many of these cases there is also adhesion of the labia, so that the condition easily leads to a mistake in the sex of the child. If added to this there be a pudendal hernia, on each side, of the ovary, the resemblance to the scrotum is almost absolute and the correct diagnosis would probably not be made until the approach of puberty leads to a careful re-examination. These forms of hermaphrodisism, while not very common, are not ordinarily so complete as to produce any great difficulty in the determination of the real sex of the subject.

If the clitoris is so enlarged as to interfere in any way with the proper functions of the parts, it should be amputated. The ovaries if protruding should be replaced, and the hernial sack obliterated and the canal closed by standard surgical procedures.



## CHAPTER XXIX.

### STERILITY AND STERILIZATION.

**I**N investigating cases of sterility it is well to bear in mind that in probably one-sixth of all cases coming to the attention of the physician the defect is in the husband instead of the wife. Unless, therefore, quite distinct pathological lesions are found in the latter, the seminal vitality of the former should be first inquired into.

The most frequent cause of sterility on the part of the female is unquestionably disease of the Fallopian tubes by which a mechanical obstruction is offered to the passage of the spermatozoa and of the ovule. Failure to ovulate, owing to lack of development of the ovary or to ovarian disease, is probably a very infrequent cause. The slightest bit of healthy ovary is sufficient to preserve that function. Uterine flexions, if extreme, by interfering with the proper drainage of the uterus, may keep up a sufficient amount of endometritis to interfere with fecundation. A profuse leucorrhea, no matter what its origin, may also mechanically produce the same result.

If a backward displacement of the uterus seems to be the cause of the sterility, or if the tubes or ovaries are bound down by adhesions, operative interference will be necessary to restore the parts to their normal condition, when impregnation may be reasonably expected to take place.

Imperfect development of the uterus, hyper-involution, or any considerable degree of metritis of any form, are local causes, as well as the presence of tumors, whether malignant or benign, or of tuberculosis.

A careful examination of each case is necessary to ascertain if possible the conditions which prevent conception. The treatment necessary will depend entirely upon the condition found and will not be considered here.



**STERILIZATION.** In cases in which the abdomen has been opened and in which, owing to constitutional disease, deformity of the pelvis, or other reason, future pregnancies are undesirable, it is proper to prevent their occurrence by castration. Nothing of this sort, however, should be undertaken without the full knowledge and consent of both wife and husband. This consent should preferably be secured in writing. If the appendages are healthy and the patient young, so that the artificial production of the menopause is undesirable, the same effect can be secured by ligating and severing the Fallopian tubes. The simple ligation, as performed by the ordinary method for removing the appendages, will not invariably prove successful, as following the absorption of the ligature the patency of the canal is occasionally restored. I have in a number of instances, therefore, resorted to the following procedure: The peritoneal covering is opened with scissors by an incision about an inch in length along the upper border of the tube, about midway of its course. Through this incision the tube is isolated. A fine ligature of catgut or silk is

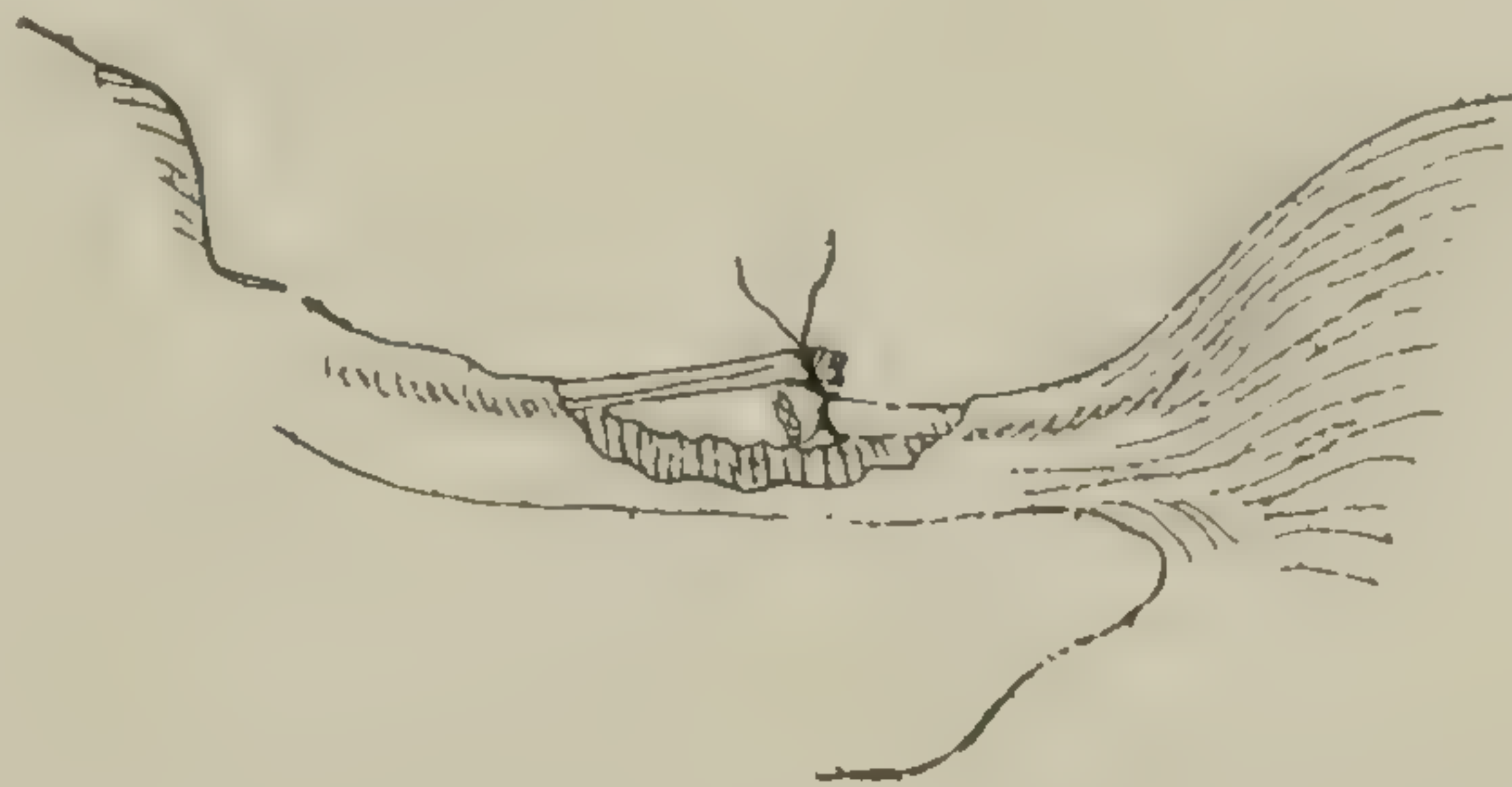


FIG. 129. Author's method of double ligation of Fallopian tube for sterilization.

passed under the tube, close to the uterine end of the incision, and the tube tied. The tube is then severed just outside the ligature, the detached end seized with forceps and drawn over the other and ligated with the same ligature. One end of the ligature is then cut short, and the other being threaded into a needle is used to close the incision in the peritoneum over the tube.







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